Note remarks

: MB 2,5 C1 Test sheet : 17.02.89 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 400 075 958

Injection pump

Pump designation : PES5M55C32ORS158-1

EP type number : 0 410 055 979

Governor

Governor design. : RSF340/2300M64-3 Governer no. : 0 420 021 101

Customer-spec. information

Customer : DAIMLER-BENZ

: 0M602A Engine

: 92.0 1st version kW : 4600 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: D 681 343 009 assembly

Openina (

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 2.20...2.30 Prestroke mm

: (2.15...2.35)

Rack travel in mm : 20.00...22.00

A01

: 1- 2- 4- 5- 3 Firing order

Phasing : 0-72-144-216-288

Tolerance + - 0 : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.90...14.00

Del.quantity cm3/ : 5.1...5.2

100 s: (5.0...5.3)

cm3 : 0.2Spread

100 s: (0.3)

2nd speed rpm : 315.0
Rack travel in mm : 5.4...5.6
Del.quantity cm3/: 0.5...0.6

100 s: (0.4...0.9)

cm3 : 0.1Spread 100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed Aneroid pressure h: 1850

Del.quantity

: 51.0...52.0 1000 : (50.0...53.0) cm3 : 2.50 1000 : (3.00) Spread

RATED SPEED

1st version

Control lever

position degrees: 50...0 3rd rack travel in: 8,1...8,5 Speed rpm : 2500

4th rack travel in: 2950

: 0.00...1.00 Speed rpm

SET IDLE CONTROL LEVER

POSITION

: 1000 rpm

Rack travel in mm: 1,7...1,8

LOW IDLE 1

Control lever

position degrees: 8...12

Setting point w/out bumper spring Speed rpm : 315 Rack travel in mm : 5.5  Testing: Speed rpm : 220 Minimum rack trave: 8.00 Speed rpm : 315 Rack travel in mm : 5.405.60 Rack travel in mm : 2.50 Speed rpm : 540640 Speed rpm : 1000 Maximum rack trave: 1.80	Spread cm3 : 2.50 1000 s: (3.00) Aneroid pressure h: 050 Speed rpm : 1000 Del.quantity cm3/ : 33.034.0 1000 s: (32.035.0) Spread cm3 : 2.50 1000 s: (3.00) STARTING FUEL DELIVERY
SET IDLE AUXILIARY SPRING Speed rpm : 380 Rack travel in mm : 4,204,40 : (4,104,50)	Speed
TORQUE CONTROL Torque control curve — 1st version 1st speed rpm : 1000 Rack travel in m: 13.9014.00 2nd speed rpm : 1600 Rack travel in m: 13.2013.40 3rd speed rpm : 2200 Rack travel in m: 12.3012.50	1st version Aneroid pressure h: 1850 Speed rpm : 2500 Rack travel in mm : 8.108.50 Del.quantity cm3/ : 29.033.0 1000 s: (28.034.0) Spread cm3 : 2.50 1000 s: (3.00)
Aneroid/Altitude Compensator Test	LOW IDLE
1st version Setting Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.500.90	Speed rpm : 315 Rack travel in mm : 5.405.60 Del.quantity cm3/ : 5.56.5 1000 s: (4.59.0) Spread cm3 : 1.00 1000 s: (1.50)
Measurement Speed 1/min: 1000	SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)
1st pressure hPa : 1050 Rack travel in m: 3.904.10 2nd pressure hPa : 750 Rack travel in m: 5.806.20  FUEL DELIVERY CHARACTERISTICS  1st version Aneroid pressure h: 1850 Speed rpm : 1600 Del.quantity cm3/: 50.051.5	Control lever at idle stop Speed rpm: 340 Rack travel in mm: (12,413,8) Del.quantity cm3/:- 1000 s: (41,049,0) Current A: 1,8 Control lever at full-load stop Speed rpm: 2950 Rack travel in mm: 0,01,0 Current short-duration A: 3,0 Starting test
1000 s: (49.052.5)  Spread cm3 : 2.50	Speed rpm : 100  Del.quantity cm3/: -  min. 1000 s: 52,0  Remarks:

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY
-Set max. change plus/minus 0.75 mm
control-rod travel at correction
screw on ALDA pressure box.

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF
-Control-lever position 49°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE
-Control lever at idle stop.
With n = 315 1/min. and pu = 450 mbar, control rod must move quickly to control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Note remarks

: MB 2,5 F6 : 17.02.89 Test sheet Edition : 02.06.87 Replaces : ISO-4113 Test oil

Combination no. : 0 400 075 959

Injection pump

Pump designation : PES5M55C32ORS166 EP type number : 0 410 055 980

Governor

Governor design. : RSF340/2300M64-1

: 0 420 021 050 Governer no.

Customer-spec. information : DB-PKW Customer

: 0M602A Engine

1st version kW : 92.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 1.70...1.80 Prestroke mm

: (1.65...1.85)

Rack travel in mm : 20.00...22.00 Firing order : 1-2-4-5-3

Phasing : 0-72-144-216-288

Tolerance + - 0 : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 14.00...14.10

Del.quantity cm3/: 5.1...5.2

100 s: (5.0...5.3)

cm3 : 0.2Spread

100 s: (0.3)

rpm : 315.02nd speed Rack travel in mm: 4.9...5.1

Del.quantity cm3/: 0.5...0.6 100 s: (0.4...0.8)

cm3 : 0.1Spread 100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000 Aneroid pressure h: 1850

Del.quantity : 51.0...52.0

1000 : (50.0...53.0) : 2.50 Spread cm3

1000 : (3.00)

RATED SPEED

1st version Control lever

position degrees: 50...0

3rd rack travel in: 8,10...8,50 Speed rpm : 2500 4th rack travel in: 2950

: 0.00...1.00 Speed rpm

SET IDLE CONTROL LEVER

**POSITION** 

rom Rack travel in mm: 1,7...1,8

LOW IDLE 1

Control lever

position degrees: 8...12

Setting point w/out bumper spring

A04

Speed rpm: 315 Rack travel in mm: 5.0  Testing: Speed rpm: 220 Minimum rack trave: 8.00 Speed rpm: 315 Rack travel in mm: 4.905.10 Rack travel in mm: 2.50 Speed rpm: 525625 Speed rpm: 1000 Maximum rack trave: 1.80	Spread cm3: 2.50 1000 s: (3.00) Aneroid pressure h: 1050 Speed rpm: 1000 Del.quantity cm3/: 33.034.0 1000 s: (32.035.0) Spread cm3: 2.50 1000 s: (3.00)  STARTING FUEL DELIVERY
SET IDLE AUXILIARY SPRING Speed rpm : 380 Rack travel in mm : 4,204,40 : (4,104,50)	Speed rpm : 100  Del.quantity cm3/ : 52.00.0  1000 s: (52.00.0)  Rack travel in mm : 20.100.00
TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 14.0014.10 2nd speed rpm : 1600 Rack travel in m: 13.3013.50 3rd speed rpm : 2200 Rack travel in m: 12.8013.00  Aneroid/Altitude Compensator Test	HIGH IDLE  1st version Aneroid pressure h: 1850 Speed rpm : 2500 Rack travel in mm : 8.108.50 Del.quantity cm3/: 31.035.0 1000 s: (30.036.0) Spread cm3 : 2.50 1000 s: (3.00) LOW IDLE
1st version Setting Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.500.90	Speed rpm : 315 Rack travel in mm : 4.905.10 Del.quantity cm3/ : 5.06.0 1000 s: (4.08.5) Spread cm3 : 1.00 1000 s: (1.50)
Measurement Speed 1/min: 1000  1st pressure hPa: 1050 Rack travel in m: 3.904.10 2nd pressure hPa: 750 Rack travel in m: 5.806.20  FUEL DELIVERY CHARACTERISTICS	SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)  Control lever at idle stop Speed rpm : 340 Rack travel in mm : (12,413,8) Del.quantity cm3/:- 1000 s: (41,049,0) Current A : 1,8
1st version Aneroid pressure h: 1850 Speed rpm : 1600 Del.quantity cm3/: 50.051.5	Control lever at full-load stop Speed rpm : 2950 Rack travel in mm : 0,01,0 Current short-duration A : 3,0 Starting test Speed rpm : 100 Del.quantity cm3/:- min. 1000 s: 52,0  Remarks: Pin projection = 16.6016.70 mm

3.310 V must be attained.

CORRECTION OF INJECTED-FUEL QUANTITY
-Set max. change plus/minus 0.75 mm
control-rod travel at correction
screw on ALDA pressure box.

CHECKING THE IDLE—SPEED AUXILIARY SPRING CUTOFF

-Control—lever position 49°, max.

0.2 mm control—rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.

Control—lever position 46.5°, control—rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

TESTING PNEUMATIC SHUTOFF DEVICE
-Control lever at idle stop.
With n = 315 1/min. and pu = 450 mbar,
control rod must move quickly to
control-rod travel = 0 mm

Testing and adjusting the control-rod-travel sensor with evaluation circuit R2.1.3

Receiving inspection
Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 3.230...3.310 (3.190...3.350) V must be displayed on the digital voltmeter.

Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 23.0...24.0 (22.0...25.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until U = 2.095...2.105 (2.098...2.102) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 3.230...

Note remarks

: MB 2,5 F : 17.02.89 Test sheet Edition : 30.03.87 Replaces : ISO-4113 Test oil

Combination no. : 0 400 075 961

Injection pump

Pump designation : PES5M55C32ORS153 EP type number : 0 410 055 991

Governor

Governor design. : RSF350/2300M67 : 0 420 021 094 Governer no.

Customer-spec. information

Customer : DB

: 0M602 Engine

1st version kW : 66.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm

: 2.00...2.10 : (1.95...2.15)

Rack travel in mm : 20.00...22.00 Firing order : 1-2-4-5-Firing order

A07

Phasing : 0-72-144-216-288

Tolerance + - 0 : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 11.30...11.40

Del.guantity cm3/: 3.1...3.2

100 s: (3.0...3.3)

Spread cm3 : 0.2

100 s: (0.3)

rpm : 350.0 2nd speed Rack travel in mm : 5.7...5.9 Del.quantity cm3/: 0.5...0.6 100 s: (0.4...0.9)

cm3 : 0.1

Spread 100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed

: 31.5...32.5 Del.quantity 1000 : (30.5...33.5)

: 2.50 Spread cm3 1000 : (3.00)

RATED SPEED

1st version Control lever

position degrees: 50...0

3rd rack travel in: 7,90...8,30

Speed rpm : 2500

4th rack travel in: 2950

: 0.00...1.00 Speed rom

SET IDLE CONTROL LEVER

POSITION

rpm Rack travel in mm : 0,9...1,0

LOW IDLE 1 Control lever

position degrees: 13...17 Setting point w/out bumper spring

Speed

rpm

Rack travel in mm : 5.8 LOW IDLE Testing: Speed rpm : 350 Rack travel in mm : 5.70...5.90 Del.quantity cm3/: 5.0...6.0 Speed : 220 rpm Minimum rack trave: 10.00 1000 s: (4.5...9.0) : 350 rpm Rack travel in mm : 5.70...5.90 cm3 : 1.00 Spread Rack travel in mm : 1.50 1000 s: (1.50) : 640...740 rpm : 1000 SETTING PNUEUMATIC FAST IDLE Speed rpm Maximum rack trave: 1.00 (ELA) SET IDLE AUXILIARY SPRING rpm : 400 : 400 Speed rpm Rack travel in mm : (5,7...7,3) Rack travel in mm : 4,20...4,40 Del.quantity cm3/: (6,0...14,0) 1000 s: -: (4,10...4,50) TORQUE CONTROL Vacuum hPa : 400 Torque control curve - 1st version rpm : 1000 1st speed Remarks: Rack travel in m: 11.30...11.40 : 1800 2nd speed rpm Rack travel in m: 10.80...11.00 Start-of-delivery sensor system: rpm : 2200 3rd speed adjustment and blocking with device KDEP  $1077 = 19.3^{\circ} \dots 19.7^{\circ}$ Rack travel in m: 10.50...10.70 (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. FUEL DELIVERY CHARACTERISTICS Difference in start of delivery between 1st version max. and min. value = max. 1° angular Speed rpm : 1800 Del.quantity cm3/ : 34.0...35.5 displacement of cam 1000 s: (33.0...36.5) CHECKING THE IDLE-SPEED AUXILIARY Spread : 2.50 SPRING CUTOFF cm3 1000 s: (3.) -Control-lever position 49°, max. : 2200 0.2 mm control-rod travel deduction Speed rom Del.quantity cm3/: 33.5...35.5 allowable after switchover point (of 1000 s: (32.5...36.5) starting cam) up to 1000 1/min. : 2.50 Control-lever position 46.5°, Spread cm3 1000 s: (3.00) control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam). STARTING FUEL DELIVERY CHECKING THE PNEUMATIC SHUTOFF BOX Speed : 100 -Control lever up against idle stop. rpm Del.quantity cm3/: 55.0...0.0 At n = 350 1/min and pu = 450 mbar 1000 s: (55.0...0.0) control rod must move briskly to Rack travel in mm : 20.10...0.00 control-rod travel = 0 mm HIGH IDLE ADJUSTMENT OF ACTIVE BUCKING DAMPING (ARD) 1st version : 2500 Control lever on full-load stop. At n = 1000 min. Speed man Rack travel in mm : 7.90...8.30 I = 2.5 A, difference in delivery referenced to Del.quantity cm3/: 22.0...26.0 1000 s: (21.0...27.0) delivery (8.8...10.8) ccm/1000 strokes. cm3 : 2.50Spread 1000 s: (3.00)

**80A** 

ad

#### Note remarks

: MB 2,5 F8 : 17.02.89 Test sheet Edition : 26.08.87 Replaces Test oil : ISO-4113

Combination no. : 0 400 075 974

Injection pump

Pump designation : PES5M55C32ORS162 EP type number : 0 410 055 983

Governor

Governor design. : RSF340/2300M60-5 : 0 420 021 063 Governer no.

Customer-spec. information

Customer : DB

Engine : 0M602-LVP MJ:86

1st version kW : 66.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

: 172...175 pressure, bar

Test lines : 1 680 750 014

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

-1 BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80 : (1.65...1.85)

Rack travel in mm : 20.00...22.00 Firing order : 1-2-4-5-

**A09** 

0

Phasing : 0-72-144-216-288

Tolerance + - 0 : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 11.30...11.40

Del.guantity cm3/: 3.1...3.2

100 s: (3.0...3.3)

cm3 : 0.2Spread

100 s: (0.3)

rpm : 315.02nd speed Rack travel in mm : 5.2...5.4

Del.quantity cm3/: 0.5...0.6 100 s: (0.4...0.9)

cm : 0.1 100 s: (0.1) Spread

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed

: 31.0...32.0 Del.quantity 1000 : (30.0...33.0)

: 2.50 cm3 Spread

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 7,1...7,5 Speed rpm : 2500 4th rack travel in: 2950

: 0.00...1.00 Speed rpm

SET IDLE CONTROL LEVER

**POSITION** 

: 1000 Speed rpm

Rack travel in mm: 1,9...2,0

LOW IDLE 1

Control lever

position degrees: 13...17 Setting point w/out bumper spring

Speed rpm

Rack travel in mm : 5.3	STARTING FUEL DELIVERY
Testing: Speed rpm: 220 Minimum rack trave: 7.50 Speed rpm: 315 Rack travel in mm: 5.205.40 Rack travel in mm: 2.50 Speed rpm: 530630 Speed rpm: 1000 Maximum rack trave: 2.00	Speed rpm : 100 Del.quantity cm3/ : 55.00.0 1000 s: (55.00.0) Rack travel in mm : 20.100.00 HIGH IDLE 1st version Speed rpm : 2500
SET IDLE AUXILIARY SPRING Speed rpm : 380 Rack travel in mm : 3,904,10 : (3,804,20)	- Speed rpm : 2500 - Rack travel in mm : 7.107.50 - Del.quantity cm3/ : 16.020.0 - 1000 s: (15.021.0) - Spread cm3 : 2.50 - 1000 s: (3.00)
TORQUE CONTROL  Torque control curve - 1st version  1st speed rpm : 1000	- LOW IDLE
Rack travel in m: 11.3011.40 2nd speed rpm : 1600 Rack travel in m: 10.9011.10 3rd speed rpm : 2250 Rack travel in m: 10.3010.50 Aneroid/Altitude	- Speed rpm : 315 - Rack travel in mm : 5.205.40 - Del.quantity cm3/ : 5.06.0 - 1000 s: (4.59.0) - Spread cm3 : 1.00 - 1000 s: (1.50)
Compensator Test	- SETTING/TESTING ELECTRONIC IDLE - REGULATION (ELR)
1st version Setting Speed rpm : 1000 Pressure hPa : 930 Rack travel mm : 0.100.50	Control lever at idle stop  Speed rpm: 340  Rack travel in mm: (12,513,9)  Del.quantity cm3/: -  1000 s: (33,041,0)  Current A: 1,8
Measurement Speed 1/min: 1000	- Control lever at full-load stop - Speed rpm : 2950 - Rack travel in mm : 0,01,0
1st pressure hPa : 840 Rack travel in m: 1.101.30 2nd pressure hPa : 700 Rack travel in m: 2.302.70  FUEL DELIVERY CHARACTERISTICS	Current - short-duration A: 3,0 - Starting test - Speed rpm: 100 - Del.quantity cm3/: min. 1000 s: 55,0
1st version	- Remarks:
Speed rpm : 1600 Del.quantity cm3/ : 34.035.5 1000 s: (33.036.5) Spread cm3 : 2.50	Pin projection = 16.6016.70 mm
1000 s: (3.)  Speed rpm : 2250  Del.quantity cm3/: 32.034.0  1000 s: (31.035.0)  Spread cm3 : 2.50  1000 s: (3.00)	CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFFControl-lever position 49°, max. 0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. Control-lever position 46.5°, control-rod travel deduction must be

greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE -Control lever at idle stop. With n = 315 1/min. and pu = 450 mbar, control rod must move quickly to control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 17.3°...17.7° (17.2...17.8°) angular displacement of cam following start of delivery of cylinder no. 1.

Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Note remarks

: MB 2,5 H6 : 17.02.89 Test sheet Edition : 06.09.88 Replaces Test oil : ISO-4113

: 0 400 075 975 Combination no.

Injection pump

Pump designation : PES5M55C32ORS159 EP type number : 0 410 055 985

Governor

Governor design. : RSF350/2300M56-2 : 0 420 021 055 Governer no.

Customer-spec. information Customer : DB

: 0M602-LVP Engine

1st version kW : 66.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

: 172...175 pressure, bar

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 1.50...1.60 : (1.45...1.65) Prestroke mm

Rack travel in mm : 20.00...22.00 Firing order : 1-2-4-5-

3

Phasing : 0-72-144-216-288

Tolerance + - 0 : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 11.50...11.60

Del.quantity cm3/: 3.2...3.3

100 s: (3.1...3.4)

cm3 : 0.2Spread

100 s: (0.3)

rpm : 350.0 2nd speed Rack travel in mm : 5.0...5.2 Del.quantity cm3/: 0.5...0.6

100 s: (0.4...0.9)

cm3 : 0.1Spread 100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed

Del.quantity : 32.0...33.0 1000 : (31.0...34.0)

: 2.50 Spread cm3

1000 : (3.00)

RATED SPEED

1st version

Control lever position degrees: 50...0

3rd rack travel in: 7.0...7,4

Speed rpm : 2500

4th rack travel in: 2950

: 0.00...1.00 Speed rpm

SET IDLE CONTROL LEVER POSITION

: 1000 Speed rpm Rack travel in mm : 1,9...2,0

LOW IDLE 1

Control lever

position degrees: 13...17

Setting point w/out bumper spring

rpm : 350 Speed

Rack travel in mm: 5.1 Testing: Speed rpm Minimum rack trave: 10.00 : 350 rpm Rack travel in mm : 5.00...5.20 : 1000 rpm Maximum rack trave: 2.00 SET IDLE AUXILIARY SPRING rpm : 400 Speed Rack travel in mm : 3,80...4,00 : (3,70...4,10) TORQUE CONTROL Torque control curve - 1st version rpm : 1000 1st speed Rack travel in m: 11.50...11.60 : 1800 2nd speed rpm Rack travel in m: 11.00...11.20 3rd speed rpm : 2250 Rack travel in m: 10.60...10.80 Aneroid/Altitude Compensator Test 1st version Setting Speed : 1000 rom hPa : 930 Pressure : 0.10...0.50 Rack travel mm Measurement Speed 1/min: 1000 1st pressure hPa : 840 Rack travel in m: 1.10...1.30 2nd pressure hPa : 700 Rack travel in m: 2.30...2.70 FUEL DELIVERY CHARACTERISTICS 1st version : 1800 Speed rpm Del.quantity cm3/: 35.0...36.5 1000 s: (34.0...37.5) cm3 : 2.50 Spread 1000 s: (3.)

Speed rpm : 2250

Del.quantity cm3/: 33.0...35.0

1000 s: (32.0...36.0) cm3 : 2.50 1000 s: (3.00) Spread

Speed rpm : 100 Del.quantity cm3/ : 52.0...0.0 1000 s: (52.0...0.0) Rack travel in mm : 20.10...0.00 HIGH IDLE 1st version Speed rpm : 2500
Rack travel in mm : 7.00...7.40
Del.quantity cm3/ : 16.0...20.0
1000 s: (15.0...21.0)
Spread cm3 : 2.50 1000 s: (3.00) LOW IDLE Speed rpm : 350 Rack travel in mm : 5.00...5.20 Del.quantity cm3/: 5.0...6.0 1000 s: (4.5...9.0) cm3 : 1.00 Spread 1000 s: (1.50) SETTING PNUEUMATIC FAST IDLE (ELA) : 400 Speed rpm Rack travel in mm : (5,1...6,7) Del.quantity cm3/: -1000 s: (5,0...13,0) hPa : 400 Vacuum Remarks: Pin projection = 16.60...16.70 mm CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF -Control-lever position 49°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam). CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.

At n = 350 1/min and pu = 450 mbar control rod must move briskly to

control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 18.3°...18.7° (18.2...18.8°) angular displacement of cam following start of delivery of cylinder no. 1.

Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Note remarks

: MB 2,5 H7 : 17.02.89 Test sheet Edition : 22.04.88 Replaces : ISO-4113 Test oil

Combination no. : 0 400 075 977

Injection pump

Pump designation : PES5M55C32ORS159 EP type number : 0 410 055 985

Governor

Governor design. : RSF340/2300M60-1 : 0 420 021 042

Governer no.

Customer-spec. information Customer : DB

: 0M602-LVP Engine

1st version kW : 66.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

: 1 680 750 014 Test lines

Outside diameter x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 1.50...1.60

: (1.45...1.65)

Rack travel in mm : 20.00...22.00 Firing order : 1-2-4-5-3

: 0-72-144-216-288 Phasing

: 0.00 (1.00) Tolerance + - 0

Time to cyl. no. : 1

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 11.50...11.60

Del.quantity cm3/: 3.2...3.3

100 s: (3.1...3.4)

cm3 : 0.2 Spread

100 s: (0.3)

rpm : 315.02nd speed Rack travel in mm: 5.0...5.2

Del.quantity cm3/: 0.5...0.6 100 s: (0.4...0.9)

cm3 : 0.1Spread

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed

: 32.0...33.0 Del.quantity

1000 : (31.0...34.0)

: 2.50 Spread cm3

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0 3rd rack travel in: 7,0...7,4

: 2500 rpm

4th rack travel in: 2950

: 0.00...1.00 Speed rom

SET IDLE CONTROL LEVER

POSITION

: 1000 Speed rpm

Rack travel in mm : 1,9...2,0

LOW IDLE 1

Control lever

position degrees: 13...17
Setting point w/out bumper spring

rpm : 315 Speed

A15

Rack travel in mm: 5.1 Testing: Speed : 220 rpm Minimum rack trave: 7.50 Speed rpm : 315 Rack travel in mm : 5.00...5.20 HIGH IDLE : 1000 rpm Maximum rack trave: 2.00 1st version : 2500 Speed rpm Rack travel in mm : 7.00...7.40 Del.quantity cm3/ : 16.0...20.0 1000 s: (15.0...21.0) SET IDLE AUXILIARY SPRING : 380 rpm Rack travel in mm : 3,80...4,00 : (3,70...4,10) : 2.50 cm3 Spread 1000 s: (3.00) TORQUE CONTROL Torque control curve - 1st version LOW IDLE st speed rpm : 1000 Rack travel in m: 11.50...11.60 1st speed Speed rpm : 315 Rack travel in mm : 5.00...5.20 : 1800 rpm 2nd speed Rack travel in m: 11.00...11.20 Del.quantity cm3/ : 5.0...6.0 : 2250 3rd speed 1000 s: (4.5...9.0) rpm cm3 : 1.00Rack travel in m: 10.60...10.80 Spread 1000 s: (1.50) Aneroid/Altitude Compensator Test SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR) 1st version Control lever at idle stop Speed rpm : 340 Rack travel in mm : (12,5...13,9) Setting : 1000 Speed rpm Del.quantity cm3/: -1000 s: (32,0...40,0) hPa : 930 Pressure : 0.10...0.50 Rack travel mm : 1,8 Current A Control lever at full-load stop Measurement Speed 1/min: 1000 : 2950 rom Rack travel in mm: 0,0...1,0 1st pressure hPa : 840 Current Rack travel in m: 1.10...1.30 short-duration A: 3,0 2nd pressure hPa : 700 Starting test Rack travel in m: 2.30...2.70 : 100 Speed rpm Del.quantity cm3/: -min. 1000 s: 52,0 FUEL DELIVERY CHARACTERISTICS Remarks: 1st version Speed : 1800 rpm Del.quantity cm3/: 35.0...36.5 1000 s: (34.0...37.5) Pin projection = 16.60...16.70 mm Spread cm3 : 2.50 1000 s: (3.) CHECKING THE IDLE-SPEED AUXILIARY : 2250 SPRING CUTOFF Speed rpm Del.quantity cm3/: 33.0...35.0 1000 s: (32.0...36.0) Spread cm3 : 2.50 1000 s: (3.00) -Control-lever position 49°, max.

0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.

Control-lever position 46.5°, control-rod travel deduction must be STARTING FUEL DELIVERY greater than 0.2 mm after switchover point (of starting cam).

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 18.3°...18.7° (18.2...18.8°) angular displacement of cam following start of delivery of cylinder no. 1.

Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

TESTING PNEUMATIC SHUTOFF DEVICE
-Control lever at idle stop.
With n = 315 1/min. and pu = 450 mbar,
control rod must move quickly to
control-rod travel = 0 mm

Note remarks

: MB 2,5 D : 08.03.89 Edition Replaces : 04.86 Test oil : ISO-4113

Combination no. : 0 400 075 979

Injection pump

Pump designation : PES5M55C32ORS153 : 0 410 055 991 EP type number

Governor

Governor design. : RSF340/2300M59-8 : 0 420 021 051 Governer no.

Customer-spec. information

Customer : DB

: 0M602 Engine

1st version kW : 66.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Openina |

pressure, bar : 172...175

: 1 680 750 014 Test lines

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 2.00...2.10 Prestroke mm

: (1.95...2.15)

Rack travel in mm : 20.00...22.00

Firing order : 1- 2- 4- 5-3

Test sheet

Phasing : 0-72-144-216-288

Tolerance + - 0 : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.30...11.40

Del.guantity cm3/: 3.1...3.2

100 s: (3.0...3.3)

cm3 : 0.2Spread

100 s: (0.3)

rpm : 315.02nd speed Rack travel in mm : 5.4...5.6

Del.quantity cm3/: 0.5...0.6 100 s: (0.4...0.9)

cm3 : 0.1 Spread

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

: 31.5...32.5 Del.quantity

1000 : (30.5...33.5)

: 2.50 Spread cm3

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 7,8...8,2 Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0,0...1,0

SET IDLE CONTROL LEVER **POSITION** 

: 1000 Speed rpm

Rack travel in mm : 0,9...1,0

LOW IDLE 1

Control lever

position degrees: 13...17

Setting point w/out bumper spring

Speed rpm : 315

Rack travel in mm: 5.5 Testing: Speed : 220 rpm Minimum rack trave: 8.00 : 380 rom Rack travel in mm : 4.20...4.40 Rack travel in mm: 1.50 : 630...730 Speed rom : 1000 Speed rpm Maximum rack trave: 1.00 SET IDEE AUXILIARY SPRING rpm Rack travel in mm : 4,20...4,40 : (4,10...4,50) TORQUE CONTROL Torque control curve - 1st version st speed rpm : 1000
Rack travel in m: 11.30...11.40
ad speed rpm : 1800
Rack travel in m: 10.90...11.10 1st speed 2nd speed : 2200 3rd speed rpm Rack travel in m: 10.60...10.80 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 1800 Del.quantity cm3/: 34.0...35.5 1000 s: (33.0...36.5) cm3 : 2.50 1000 s: (3.00) Spread : 2200 Speed rom Del.quantity cm3/: 33.5...35.5 1000 s: (32.5...36.5) Spread : 2.50 cm3 1000 s: 3.00 STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/:-1000 s: 55,0 Rack travel in mm : 20.10...0.00 HIGH IDLE 1st version Speed rpm: 2500
Rack travel in mm: 7.80...8.20 Del.quantity cm3/: 22.0...26.0 1000 s: (21.0...27.0)

: 2.50

1000 s: (3.00)

cm3

LOW IDLE

SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop
Speed rpm : 340
Rack travel in mm : (12,6...14,0)
Del.quantity cm3/: 1000 s: (33,0...41,0)
Current A : 1,8
Control lever at full-load stop

Speed rpm : 2950
Rack travel in mm : 0,0...1,0

Current short-duration A : 3,0

Starting test
Speed rpm : 100
Del.quantity cm3/: min. 1000 s: 55,0

Remarks:

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF
-Control-lever position 49°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE
-Control lever at idle stop.
With n = 315 1/min. and pu = 450 mbar,
control rod must move quickly to
control-rod travel = 0 mm

Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1.

Spread

Note remarks

: MB 2,5 C : 17.02.89 Test sheet Edition : 04.86 Replaces : ISO-4113 Test oil

Combination no. : 0 400 075 980

Injection pump

Pump designation : PES5M55C32ORS158 : 0 410 055 986 EP type number

Governor

Governor design. : RSF340/2300M64-1

: 0 420 021 050 Governer no.

Customer-spec. information

Customer : DB

: 0M602A Engine

1st version kW : 92.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening |

pressure, bar : 172...175

: 1 680 750 014 Test lines

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 2.20...2.30 Prestroke mm

: (2.15...2.35)

Rack travel in mm : 20.00...22.00

Firing order : 1-2-4-5-3 Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 13.90...14.00

Del.quantity cm3/ : 5.1...5.2

100 s: (5.0...5.3)

cm3 : 0.2Spread

100 s: (0.3)

rpm : 315.0 2nd speed Rack travel in mm : 5.4...5.6

Del.quantity cm3/: 0.5...0.6 100 s: (0.4...0.9)

Spread cm3 : 0.1

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del.quantity : 51.0...53.0)

Soread cm3 : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0 3rd rack travel in: 8,1...8,5

: 2500

Speed rom 4th rack travel in: 2950

: 0.00...1.00 Speed rpm

SET IDLE CONTROL LEVER

**POSITION** 

rpm

Rack travel in mm: 1,7...1,8

LOW IDLE 1

Control Lever

position degrees: 8...12

Setting point w/out bumper spring

A20

Speed rpm: 315 Rack travel in mm: 5.5  Testing: Speed rpm: 220 Minimum rack trave: 8.00 Speed rpm: 315 Rack travel in mm: 5.405.60 Rack travel in mm: 2.50 Speed rpm: 540640 Speed rpm: 1000 Maximum rack trave: 1.80	Spread cm3 : 2.50 1000 s: (3.00) Aneroid pressure h: 1050 Speed rpm : 1000 Del.quantity cm3/: 33.034.0 1000 s: (32.035.0) Spread cm3 : 2.50 1000 s: (3.00) STARTING FUEL DELIVERY
SET IDLE AUXILIARY SPRING Speed rpm : 380 Rack travel in mm : 4,24,4 : (4,14,5)	Speed rpm : 100  Del.quantity cm3/: 52.00.0  1000 s: (52.00.0)  Rack travel in mm : 20.100.00
TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 13.9014.00 2nd speed rpm : 1600 Rack travel in m: 13.2013.40 3rd speed rpm : 2200 Rack travel in m: 12.3012.50 Aneroid/Altitude Compensator Test	HIGH IDLE  1st version Aneroid pressure h: 1850 Speed rpm : 2500 Rack travel in mm : 8.108.50 Del.quantity cm3/ : 29.033.0 1000 s: (28.034.0) Spread cm3 : 2.50 1000 s: (3.00) LOW IDLE
1st version Setting Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.500.90 Measurement	Speed rpm : 315 Rack travel in mm : 5.405.60 Del.quantity cm3/ : 5.56.5 1000 s: (4.59.0) Spread cm3 : 1.00 1000 s: (1.50)
Speed 1/min: 1000  1st pressure hPa: 1050 Rack travel in m: 3.904.10  2nd pressure hPa: 750 Rack travel in m: 5.806.20  FUEL DELIVERY CHARACTERISTICS	SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)  Control lever at idle stop Speed rpm : 340 Rack travel in mm : (12,413,8 Del.quantity cm3/:- 1000 s: (41,049,0) Current A : 1,8
1st version Aneroid pressure h: 1850 Speed rpm : 1600 Del.quantity cm3/ : 50.051.5	Control lever at full-load stop Speed rpm: 2950 Rack travel in mm: 0,01,0 Current short-duration A: 3,0 Starting test Speed rpm: 100 Del.quantity cm3/:- min. 1000 s: 52,0  Remarks: CHECKING THE IDLE-SPEED AUXILIARY

SPRING CUTOFF
-Control-lever position 49°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE
-Control lever at idle stop.
With n = 315 1/min. and pu = 450 mbar,
control rod must move quickly to
control-rod travel = 0 mm

Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Start—of—delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Testing and adjusting the control—rod—

Testing and adjusting the control-rodtravel sensor with evaluation circuit R2.1.3

R2.1.3
Receiving inspection
Shift control lever to full-load stop.
Set 13.5 V at stabilizer. Apply
1850 hPa to ALDA. Run up to speed of
1000 1/min; a voltage of 3.230...3.310
(3.190...3.350) V must be displayed
on the digital voltmeter.

Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 23.0...24.0 (22.0...25.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until U = 2.095...2.105 (2.098...2.102) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 3.230... 3.310 V must be attained.

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY
-Set max. change plus/minus 0.75 mm
control-rod travel at correction

screw on ALDA pressure box.

#### Note remarks

: MB 2,5 E : 17.02.89 Test sheet Edition : 04.86 Replaces : ISO-4113 Test oil

: 0 400 075 982 Combination no.

Injection pump

Pump designation : PES5M55C32ORS153 EP type number : 0 410 055 991

Governor

Governor design. : RSF340/2300M59-4 : 0 420 021 043 Governer no.

Customer-spec. information

Customer : DB

: 0M602 Engine

1st version kW : 66.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

assembly : 0 681 343 009

Openina

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 2.00...2.10 Prestroke mm

: (1.95...2.15)
Rack travel in mm : 20.00...22.00
Firing order : 1-2-4-5-

Firing order

: 0-72-144-216-288 Phasing

: 0.00 (1.00) Tolerance + - °

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 11.30...11.40

Del.quantity cm3/: 3.1...3.2

100 s: (3.0...3.3)

cm3 : 0.2Spread

100 s: (0.3)

2nd speed rpm : 315.0 Rack travel in mm : 5.4...5.6 Del.quantity cm3/: 0.5...0.6

100 s: (0.4...0.9)

Spread cm3 : 0.1

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed

: 31.5...32.5 : (30.5...33.5) Del.quantity 1000

cm3 : 2.50 Spread

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0
3rd rack travel in: 7,8...8,2
Speed rpm : 2500

4th rack travel in: 2950

: 0.00...1.00 Speed rpm

SET IDLE CONTROL LEVER

POSITION

mar Rack travel in mm : 0,9...1,0

LOW IDLE 1

Control lever

position degrees: 13...17
Setting point w/out bumper spring
Speed rpm : 315

Rack travel in mm: 5.5 Testing: Speed : 220 rpm Minimum rack trave: 8.00 : 315 Speed Rack travel in mm : 5.40...5.60
Rack travel in mm : 1.50
Speed rpm : 630...730
Speed rpm : 1000
Maximum rack trave: 1.00 rpm SET IDLE AUXILIARY SPRING rpm : 380 Rack travel in mm : 4,20...4,40 : (4,10...4,50) TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 11.30...11.40 and speed rpm : 1800 Rack travel in m: 10.90...11.10 rd speed rpm : 2200 Rack travel in m: 10.60...10.80 2nd speed 3rd speed FUEL DELIVERY CHARACTERISTICS 1st version : 1800 Speed rpm Del.quantity cm3/: 34.0...35.5 1000 s: (33.0...36.5) cm3 : 2.50 Spread Spread cms : 2.50 1000 s: (3.00) Speed rpm : 2200 Del.quantity cm3/: 33.5...35.5 1000 s: (32.5...36.5) Spread cm3 : 2.50 1000 s: (3.00) STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 55.0...0.0 1000 s: (55.0...0.0) Rack travel in mm: 20.10...0.00 HIGH IDLE 1st version Speed rpm : 2500 Rack travel in mm : 7.80...8.20 Del.quantity cm3/: 22.0...26.0 1000 s: (21.0...27.0) Spread cm3 : 2.50 1000 s: (3.00)

LOW IDLE Speed rpm : 315 Rack travel in mm : 5.40...5.60 Del.quantity cm3/: 5.0...6.0 1000 s: (4.5...9.0) Spread cm3 : 1.00 1000 s: (1.50) SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR) Control lever at idle stop rpm : 340 Rack travel in mm : (12,6...14,0) Del.quantity cm3/: -1000 s: (33,0...41,0) : 1,8 Current A Control lever at full-load stop Speed rpm : 2950 Rack travel in mm : 0,0...1,0 Current short-duration A: 3,0 Starting test rpm : 100 Speed Del.quantity cm3/: -min. 1000 s: 55,0 Remarks: CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF -Control-lever position 49°, max.

0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.

Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam). TESTING PNEUMATIC SHUTOFF DEVICE

TESTING PNEUMATIC SHUTOFF DEVICE
-Control lever at idle stop.
With n = 315 1/min. and pu = 450 mbar,
control rod must move quickly to
control-rod travel = 0 mm

Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1.

Note remarks

: MB 2,5 A : 17.02.89 Test sheet Edition Replaces : 12.85 Test oil : ISO-4113

Combination no. : 0 400 075 986

Injection pump

Pump designation : PES5M55C32ORS153 EP type number : 0 410 055 991

Governor

Governor design. : RSF350/2300M55-3 : 0 420 021 041 Governer no.

Customer-spec. information Customer : DB

Engine : 0M602

1st version kW : 66.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

: 172...175 pressure, bar

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 2.00...2.10 : (1.95...2.15) Prestroke mm

Rack travel in mm : 20.00...22.00

Firing order : 1- 2- 4- 5- 3 Phasina : 0-72-144-216-288

Tolerance + - 0 : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 11.30...11.40

Del.quantity cm3/: 3.1...3.2

100 s: (3.0...3.3)

cm3 : 0.2Spread

100 s: (0.3)

2nd speed rpm : 350.0 Rack travel in mm : 5.4...5.6 Del.quantity cm3/ : 0.5...0.6 100 s: (0.4...0.9)

cm3 : 0.1Spread

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 31.3...33.5)

Spread cm3 : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0 3rd rack travel in: 7,8...8,2 Speed rpm : 2500

4th rack travel in: 2950

: 0.00...1.00 Speed rpm

SET IDLE CONTROL LEVER

POSITION

rpm Rack travel in mm : 0,9...1,0

LOW IDLE 1

Control lever

position degrees: 13...17

Setting point w/out bumper spring

rpm : 350

A25

Rack travel in mm: 5.5 Testing: Speed : 220 rpm Minimum rack trave: 10.00 Speed rpm : 350
Rack travel in mm : 5.40...5.60
Rack travel in mm : 1.50 Speed : 640...740 rom Speed : 1000 rpm Maximum rack trave: 1.00 SET IDLE AUXILIARY SPRING : 400 rpm Rack travel in mm : 4,20...4,40 : (4,10...4,50) TORQUE CONTROL Torque control curve - 1st version t speed rpm : 1000 Rack travel in m: 11.30...11.40 1st speed nd speed rpm : 1800 Rack travel in m: 10.90...11.10 2nd speed rpm : 2200 3rd speed Rack travel in m: 10.60...10.80 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 1800 Del.quantity cm3/: 34.0...35.5 1000 s: (33.0...36.5) cm3 : 2.50 1000 s: (3.00) Spread : 2200 Speed rom Del.quantity cm3/: 33.5...35.5 1000 s: (32.5...36.5) : 2.50 Spread cm3 1000 s: (3.00) STARTING FUEL DELIVERY Speed : 100 rpm Del.quantity cm3/: 55.0...0.0 1000 s: (55.0...0.0) Rack travel in mm : 20.10...0.00 HIGH IDLE 1st version Speed rpm : 2500
Rack travel in mm : 7.80...8.20 Del.quantity cm3/: 22.0...26.0

1000 s: (21.0...27.0) : 2.50

1000 s: (3.00)

cm3

# LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.40...5.60
Del.quantity cm3/: 5.0...6.0
1000 s: (4.5...9.0)
Spread cm3 : 1.00 1000 s: (1.50)

SETTING PNUEUMATIC FAST IDLE (ELA)

rpm : 400 Rack travel in mm : (5,2...6,8) Del.quantity cm3/: -1000 s: (5,0...13,0) Vacuum hPa : 400

Remarks:

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF -Control-lever position 49°, max. 0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX -Control lever up against idle stop. At n = 350 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Spread

Note remarks

: MB 3,0 01 : 17.02.89 Test sheet Edition Replaces : 12.85 : ISO-4113 Test oil

Combination no. : 0 400 075 991

Injection pump

Pump designation : PES5M55C32ORS108-1

EP type number : 0 410 055 992

Governor

Governor design. : RSF350/2300M15 : 0 420 021 014 Governer no.

Customer-spec. information

Customer : DB

: 0M617 (3.0 L) Engine

1st version kW : 65.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 012

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30

: (2.15...2.35)

Rack travel in mm : 20.00...0.00

Firing order : 1-2-4-5-3 Phasina : 0-72-144-216-288

Tolerance + - 0 : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 13.40...13.50

Del.guantity cm3/: 3.9...4.0

100 s: (3.8...4.1)

cm3 : 0.2Spread

100 s: (0.3)

2nd speed rpm : 350.0 Rack travel in mm : 6.0...6.2 Del.quantity cm3/: 0.6...0.7

100 s: (0.5...0.9)

cm3 : 0.1Spread 100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

: 39.0...40.0 Del.quantity

1000 : (38.0...41.0)

Spread cm3 : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

Testing:

1st rack travel in: 9.00 rpm : 0...2500 Speed

4th rack travel in: 2950

: 0.00...1.00 Speed man

SET IDLE CONTROL LEVER

**POSITION** 

: 1000 Speed rpm Rack travel in mm: 1,4...1,5

LOW IDLE 1

Control lever

position degrees: 9...13

Setting point w/out bumper spring

Speed rpm : 350

A27

Rack travel in mm: 6.1 Testing: : 250 Speed rpm Minimum rack trave: 10.00 : 350 Speed rom Rack travel in mm : 6.00...6.20
Rack travel in mm : 2.00
Speed rpm : 720...820
Speed rpm : 300
Maximum rack trave: 9.50 SET IDLE AUXILIARY SPRING rpm : 450 Rack travel in mm : 4,60...4,80 : (4,50...4,90) TORQUE CONTROL Torque control curve - 1st version rpm : 1000 1st speed Rack travel in m: 13.40...13.50 rpm : 1800 2nd speed Rack travel in m: 13.00...13.20 3rd speed rpm : 2200 Rack travel in m: 12.50...12.70 FUEL DELIVERY CHARACTERISTICS 1st version : 1800 Speed rpm Del.quantity cm3/: 39.0...41.0 1000 s: (38.0...42.0) Spread cm3 : 2.501000 s: (3.00) : 2200 Speed rpm Del.quantity cm3/: 39.5...41.5 1000 s: (38.5...42.5) cm3 : 2.50 Spread 1000 s: (3.00) STARTING FUEL DELIVERY : 100 Speed rpm Del.quantity cm3/: 53.0...0.0 Rack travel in mm: 20.10...0.00 HIGH IDLE 1st version Speed : 2500 rpm Rack travel in mm : 8.60...9.00 Del.quantity cm3/: 23.0...27.0 1000 s: (22.0...28.0) cm3 : 2.50 Spread 1000 s: (3.00)

LOW IDLE

**A28** 

Remarks:

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF
-Control-lever position 47°. No change in control-rod travel after switchover point up to 550 1/min, control-lever position 30°. Speed range 350 1/min...450 1/min.

TESTING PNEUMATIC SHUTOFF DEVICE
-Control lever at idle stop.
With n = 375 1/min. and pu = 450 mbar,
control rod must move quickly to
control-rod travel = 0 mm

Note remarks

Test sheet : MB 3,0 W25 : 17.02.89 Edition

Test oil : ISO-4113

Combination no. : 0 400 076 967

Injection pump

Pump designation : PES6M55C32ORS171-1

EP type number : 0 410 056 987

Governor

Governor design. : RSF315/2300M60-8 : 0 420 021 114 Governer no.

Customer-spec. information

Customer : DB-PKW

Engine : 0M603-ECE

1st version kW : 80.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

: 172...175 pressure, bar

: 1 680 750 014 Test lines

Outside diameter

x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10

: (1.95...2.15)

Rack travel in mm : 20.00...22.00

Firing order : 1-5-3-6-2-4

Replaces

Tolerance + - 0

: 0-60-120-180-240-300

: 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

Phasing

1st speed rpm: 1000

Rack travel in mm : 12.50...12.60

Del.quantity cm3/: 3.1...3.2

100 s: (3.0...3.3)

cm3 : 0.2Spread

100 s: (0.3)

2nd speed rpm : 290.0 Rack travel in mm : 7.1...7.3 Del.quantity cm3/: 0.5...0.6

100 s: (0.5...0.9)

cm3 : 0.1Spread 100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000 Aneroid pressure h: 1100

: 31.0...32.0 Del.quantity

1000 : (30.0...33.0)

Spread cm3 : 2.50 1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 9,0...9,4

Speed rpm : 2500

4th rack travel in: 2950

: 0.00...1.00 Speed rpm

SET IDLE CONTROL LEVER

**POSITION** 

rpm

Rack travel in mm : 1,7...1,8

LOW IDLE 1

Control Lever

position degrees: 12...16

Setting point w/out bumper spring

B01

Speed rpm : 290 Rack travel in mm : 7.2 cm3 : 2.50 1000 s: (3.00) Spread Testina: Speed STARTING FUEL DELIVERY rpm Minimum rack trave: 9.00 Speed rpm : 290
Rack travel in mm : 7.10...7.30
Rack travel in mm : 2.50 Speed rpm : 100
Del.quantity cm3/ : 52.0...0.0
1000 s: (52.0...0.0)
Rack travel in mm : 20.10...0.00 : 600...700 Speed rpm Speed : 1000 rpm Maximum rack trave: 1.80 HIGH IDLE SET IDLE AUXILIARY SPRING Speed rpm : 360 1st version Rack travel in mm : 5,50...5,70 : (5,40...5,80) Aneroid pressure h: 1100 Speed rpm : 2500 Rack travel in mm : 9.00...9.40 Del.quantity cm3/ : 22.0...26.0 1000 s: (21.0...27.0) TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 cm3 : 2.50 1000 s: (3.00) Spread Rack travel in m: 12.50...12.60 nd speed rpm : 1400 2nd speed rpm Rack travel in m: 12.30...12.50 LOW IDLE rpm : 2200 3rd speed Rack travel in m: 11.90...12.10 Speed rpm Rack travel in mm: 7.10...7.30 Del.quantity cm3/: 5.5...6.5 1000 s: (5.0...9.5) Aneroid/Altitude Compensator Test cm3 : 1.00 Spread 1000 s: (1.50) 1st version Setting SETTING/TESTING ELECTRONIC IDLE Speed : 1000 REGULATION (ELR) rpm Pressure hPa : 950 : 0.00...0.20 Control lever at idle stop Rack travel mm rpm : 315 Rack travel in num.

Del.quantity cm3/: 
1000 s: (27,0...35,0)

: 1,8 Measurement 1/min: 1000 Speed 1st pressure hPa : 900 Rack travel in m: 0.50...0.70 Control lever at full-load stop : 2950 2nd pressure hPa : 750 Speed rpm Rack travel in m: 1.80...2.20 Rack travel in mm : 0,0...1,0 Current FUEL DELIVERY CHARACTERISTICS short-duration A: 3,0 Starting test Speed rpm Del.quantity cm3/: -min. 1000 s: 52,0 1st version Aneroid pressure h: 1100 Aneroid pressure n: 1100 Speed rpm: 1400 Del.quantity cm3/: 31.0...32.5 1000 s: (30.0...33.5) Spread cm3: 2.50 1000 s: (3.00) Remarks: Pin projection = 16.60...16.70 mm Aneroid pressure h: 1100 Speed rpm : 2200 CHECKING THE IDLE-SPEED AUXILIARY Del.quantity cm3/: 33.5...35.5 1000 s: (32.5...36.5) SPRING CUTOFF -Control-lever position 49°, max. 0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 290 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Note remarks

: MB 3,0 W26 : 17.02.89 Test sheet Edition

Replaces

Test oil : ISO-4113

: 0 400 076 969 Combination no.

Injection pump

Pump designation : PES6M55C32ORS174 EP type number : 0 410 056 988

Governor

Governor design. : RSF315/2300M72-2 : 0 420 021 121 Governer no.

Customer-spec. information

Customer : DB

Engine : OM603-Abgast.

1st version kW : 76.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Openina |

pressure, bar : 172...175

: 1 680 750 014 Test lines

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 1.70...1.80 : (1.65...1.85) Prestroke mm

Rack travel in mm : 20.00...22.00 Firing order : 1-5-3-6-

**B04** 

: 0-60-120-180-240-300 Phasina

Tolerance + - 0 : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rom : 1000

Rack travel in mm : 12.40...12.50

Del.quantity cm3/: 3.1...3.2

100 s: (3.0...3.3)

cm3 : 0.2Spread

100 s: (0.3)

2nd speed rpm : 300.0 Rack travel in mm : 7.0...7.2

Del.quantity cm3/: 0.6...0.7

100 s: (0.6...1.0) Spread cm3 : 0.1

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed Aneroid pressure h: 1100

: 31.5...32.5 Del.quantity

1000 : (30.5...33.5) : 2.50 cm3

Spread 1000 : (3.00)

RATED SPEED

1st version

Control Lever

position degrees: 50...0

3rd rack travel in: 9,1...9,5
Speed rpm : 2500

4th rack travel in: 2950

: 0.00...1.00 Speed rom

SET IDLE CONTROL LEVER

POSITION

: 1000 rpm

Rack travel in mm : 1,4...1,5

LOW IDLE 1

Control Lever

position degrees: 12...16

Setting point w/out bumper spring

speed rpm : 300 Rack travel in mm : 7.1 cm3 : 2.50 1000 s: (3.00) Spread Testing: Speed rpm: 220
Minimum rack trave: 7.00
Speed rpm: 300
Rack travel in mm: 7.00...7.20
Rack travel in mm: 2.50
Speed rpm: 600...700 STARTING FUEL DELIVERY Speed : 1000 rpm Maximum rack trave: 1.50 HIGH IDLE SET IDLE AUXILIARY SPRING Speed rpm : 360 1st version Rack travel in mm : 5,30...5,50 Aneroid pressure h: 1100 : (5,20...5,60) rpm : 2500 Speed Rack travel in mm: 9.10...9.50
Del.quantity cm3/: 22.0...26.0
1000 s: (21.0...27.0)
Spread cm3: 2.50
1000 s: (3.00) TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 12.40...12.50 : 1800 2nd speed rpm Rack travel in m: 11.80...12.00 LOW IDLE 3rd speed rpm : 2200 Rack travel in m: 11.50...11.70 Speed rpm : 300 Rack travel in mm : 7.00...7.20 Del.quantity cm3/: 6.5...7.5 1000 s: (6.0...10.5) Spread cm3 : 1.00 1000 s: (1.50) Aneroid/Altitude Compensator Test 1st version Setting SETTING/TESTING ELECTRONIC IDLE Speed : 1000 REGULATION (ELR) man hPa : 950 Pressure : 0.00...0.20 Rack travel mm Control lever at idle stop rpm : 315 Speed
Rack travel in mm ....
Del.quantity cm3/: 1000 s: (28,0...36,0)
: 1,8 Measurement Speed 1/min: 1000 1st pressure hPa : 900 Rack travel in m: 0.50...0.70 2nd pressure hPa : 750 Control lever at full-load stop Speed rpm : 2950 rpm Rack travel in m: 1.80...2.20 Rack travel in mm: 0,0...1,0 Current FUEL DELIVERY CHARACTERISTICS short-duration A: 3,0 Starting test rpm : 100 Speed Del.quantity cm3/: -min. 1000 s: 52,0 1st version Aneroid pressure h: 1100 Speed rpm : 1800
Del.quantity cm3/ : 34.5...36.0
1000 s: (33.5...37.0)
Spread cm3 : 2.50
1000 s: (3.00) Remarks: Pin projection = 16.60...16.70 mm Aneroid pressure h: 1100 Speed rpm : 2200 Del.quantity cm3/: 33.0...35.0 1000 s: (32.0...36.0) CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF -Control-lever position 49°, max. 0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE
-Control lever at idle stop.
With n = 300 1/min. and pu = 450 mbar,
control rod must move quickly to
control-rod travel = 0 mm

START-OF-DELIVERY ADJUSTMENT
-Start-of delivery adjustment and lock after start-of-delivery mean value of all cylinders, 16.3...16.7° (16.2...16.8°) angular displacement of the cam after cylinder 1.

Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

ADJUSTMENT OF ACTIVE BUCKING DAMPING (ARD) + Control lever on full-load stop. At n = 1000 min. -1, I = 2.5 A, difference in delivery referenced to full-load delivery (7.7...9.9) ccm/1000 strokes. +

Note remarks

: MB 3,0 W22 : 17.02.89 Test sheet Edition : 19.08.88 Replaces Test oil : ISO-4113

Combination no. : 0 400 076 970

Injection pump

Pump designation : PES6M55C32DRS174 EP type number : 0 410 056 988

Governor

Governor design. : RSF315/2300M60-21 : 0 420 021 122

Governer no.

Customer-spec. information Customer

Engine : OM603-Abgast.

1st version kW : 76.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

pressure, bar : 172...175

: 1 680 750 014 Test lines

Outside diameter

x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 1.70...1.80 Prestroke mm

: (1.65...1.85)

Rack travel in mm : 20.00...22.00

Firing order : 1-5-3-6-2-4

**B07** 

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 12.40...12.50

Del.quantity cm3/: 3.1...3.2

100 s: (3.0...3.3)

Spread cm3 : 0.2

100 s: (0.3)

rpm : 290.0 2nd speed Rack travel in mm : 6.6...6.8 Del.quantity cm3/: 0.5...0.6

100 s: (0.5...0.9)

Spread cm3 : 0.1

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1100
Del.quantity : 31.5...32.5
1000 : (30.5...33.5)
Spread cm3 : 2.50

: (3.00) 1000

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 9,1...9,5
Speed rpm : 2500
4th rack travel in: 2950

: 0.00...1.00 Speed rpm

SET IDLE CONTROL LEVER

POSITION

rpm

Rack travel in mm : 1,4...1,5

LOW IDLE 1

Control lever

position degrees: 12...16

Setting point w/out bumper spring

Speed rpm : 290 Rack travel in mm : 6.7 cm3 : 2.50Spread 1000 s: (3.00) Testina: Speed rpm: 220
Minimum rack trave: 7.00
Speed rpm: 290
Rack travel in mm: 6.60...6.80
Rack travel in mm: 2.50
Speed rpm: 570...670 STARTING FUEL DELIVERY Speed rpm : 100
Del.quantity cm3/ : 52.0...0.0
1000 s: (52.0...0.0)
Rack travel in mm : 20.10...0.00 : 1000 Speed rpm Maximum rack trave: 1.50 HIGH IDLE SET IDLE AUXILIARY SPRING Speed rpm : 360 Rack travel in mm : 5,20...5,40 1st version Aneroid pressure h: 1100 : (5,10...5,50) rpm Rack travel in mm : 9.10...9.50 Del.quantity cm3/: 22.0...26.0 1000 s: (21.0...27.0) Spread cm3 : 2.50 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000
Rack travel in m: 12.40...12.50
2nd speed rpm : 1800
Rack travel in m: 11.80...12.00
3rd speed rpm : 2200 1000 s: (3.00) LOW IDLE Rack travel in m: 11.50...11.70 : 290 Speed rpm Rack travel in mm : 6.60...6.80 Del.quantity cm3/: 5.5...6.5 Aneroid/Altitude 1000 s: (5.0...9.5) Compensator Test cm3 : 1.00Spread 1000 s: (1.50) 1st version Setting SETTING/TESTING ELECTRONIC IDLE Speed : 1000 REGULATION (ELR) rpm hPa : 950 Pressure : 0.00...0.20 Control lever at idle stop Rack travel mm Speed rpm Rack travel in mm : (12,8...14,2) Measurement 1/min: 1000 Del.quantity cm3/: -1000 s: (28,0...36,0) Speed Current A 1st pressure hPa : 900 Rack travel in m: 0.50...0.70 Control lever at full-load stop 2nd pressure hPa : 750 Speed rpm Rack travel in m: 1.80...2.20 Rack travel in mm : 0,0...1,0 Current FUEL DELIVERY CHARACTERISTICS short-duration A: 3,0 Starting test rpm : 100 Del.quantity cm3/: -min. 1000 s: 52,0 1st version Aneroid pressure h: 1100 rpm : 1800 Del.quantity cm3/: 34.5...36.0 1000 s: (33.5...37.0) Spread cm3 : 2.50 Remarks: Pin projection = 16.60...16.70 mm 1000 s: (3.00) Aneroid pressure h: 1100 Speed rpm : 2200 Del.quantity cm3/: 33.0...35.0 1000 s: (32.0...36.0) CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF -Control-lever position 49°, max. 0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 290 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

START-OF-DELIVERY ADJUSTMENT
-Start-of delivery adjustment and lock
after start-of-delivery mean value of
all cylinders, 16.3...16.7°
(16.2...16.8°) angular displacement of
the cam after cylinder 1.

Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Note remarks

Test sheet : MB 3,0 W23 Edition : 17.02.89 Replaces : 05.08.88 Test oil : ISO-4113

: 0 400 076 971 Combination no.

Injection pump

Pump designation : PES6M55C32ORS171 EP type number : 0 410 056 989

Governor

Governor design. : RSF315/2300M60-8 : 0 420 021 114 Governer no.

Customer-spec. information Customer : DB

Engine : OM603-ECE

1st version kW : 80.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

: 172...175 pressure, bar

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10 : (1.95...2.15)

Rack travel in mm : 20.00...22.00 Firing order : 1-5-3-6-2-

**B10** 

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 12.50...12.60

Del.quantity cm3/: 3.1...3.2

100 s: (3.0...3.3)

cm3 : 0.2Spread

100 s: (0.3)

2nd speed rpm : 290.0
Rack travel in mm : 7.1...7.3
Del.quantity cm3/: 0.5...0.6
100 s: (0.5...0.9)
Spread cm3 : 0.1

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000 Aneroid pressure h: 1100

Del.quantity : 31.0...33.0)

: 2.50 : (3.00) Spread cm3

1000

RATED SPEED

1st version

Control lever

position degrees: 50...0 3rd rack travel in: 9,0...9,4 Speed rpm : 2500

4th rack travel in: 2950

: 0.00...1.00 Speed rpm

SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000 Rack travel in mm : 1,7...1,8

LOW IDLE 1

Control lever

position degrees: 12...16

Setting point w/out bumper spring

Speed rpm : 290 Rack travel in mm : 7.2 cm3 : 2.50Spread 1000 s: (3.00) Testing: Speed rpm : 220 STARTING FUEL DELIVERY Minimum rack trave: 9.00 : 290 rpm Rack travel in mm : 7.10...7.30 rpm : 100 Speed Del.quantity cm3/: 52.0...0.0 1000 s: (52.0...0.0) Rack travel in mm: 20.10...0.00 Rack travel in mm : 2.50 Speed rpm : 600...700 Speed rpm : 1000 Maximum rack trave: 1.80 HIGH IDLE SET IDLE AUXILIARY SPRING Speed rpm : 360 Rack travel in mm : 5,50...5,70 : (5,40...5,80) 1st version Aneroid pressure h: 1100 Speed rpm : 2500 Rack travel in mm : 9.00...9.40 Del.quantity cm3/: 22.0...26.0 TORQUE CONTROL 1000 s: (21.0...27.0) Torque control curve - 1st version : 1000 cm3 : 2.50 1st speed rpm Spread 1000 s: (3.00) Rack travel in m: 12.50...12.60 2nd speed rpm : 1400 Rack travel in m: 12.30...12.50
3rd speed rpm : 2200
Rack travel in m: 11.90...12.10 LOW IDLE Speed rpm : 290
Rack travel in mm : 7.10...7.30
Del.quantity cm3/ : 5.5...6.5
1000 s: (5.0...9.5) Aneroid/Altitude Compensator Test cm3 : 1.00 Spread 1000 s: (1.50) 1st version Setting SETTING/TESTING ELECTRONIC IDLE Speed rpm : 1000 REGULATION (ELR) hPa : 950 Pressure Rack travel mm : 0.00...0.20 Control lever at idle stop rpm : 315 Speed Rack travel in mm : (12,5...13,9) Measurement Del.quantity cm3/: -1000 s: (27,0...35,0) 1/min: 1000 Speed 1st pressure hPa : 900 Rack travel in m: 0.50...0.70 Current A : 1,8 Control lever at full-load stop 2nd pressure hPa : 750 : 2950 Speed rpm Rack travel in m: 1.80...2.20 Rack travel in mm : 0,0...1,0 Current FUEL DELIVERY CHARACTERISTICS short-duration A: 3,0 Starting test rpm : 100 Speed Del.quantity cm3/: -min. 1000 s: 52,0 1st version Aneroid pressure h: 1100 Speed rpm : 1400 Del.quantity cm3/: 31.0...32.5 1000 s: (30.0...33.5) Spread cm3 : 2.50 1000 s: (3.00) min. Remarks: Pin projection = 16.60...16.70 mm Aneroid pressure h: 1100 : 2200 Speed CHECKING THE IDLE-SPEED AUXILIARY rpm Del.quantity cm3/: 33.5...35.5 1000 s: (32.5...36.5) SPRING CUTOFF -Control-lever position 49°, max. 0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 290 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Note remarks

: MB 3,0 W24 : 17.02.89 Test sheet Edition Replaces : 19.08.88 Test oil : ISO-4113

: 0 400 076 972 Combination no.

Injection pump

Pump designation : PES6M55C32ORS171 : 0 410 056 989 EP type number

Governor

Governor design. : RSF315/2300M72-1 : 0 420 021 115 Governer no.

Customer-spec. information

Customer

: 0M603-ECE Engine

1st version kW : 80.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 2.00...2.10 Prestroke mm

: (1.95...2.15)

Rack travel in mm : 20.00...22.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 12.50...12.60

Del.quantity cm3/: 3.1...3.2

100 s: (3.0...3.3)

cm3 : 0.2Spread

100 s: (0.3)

2nd speed rpm : 300.0 Rack travel in mm : 7.3...7.5 Del.quantity cm3/ : 0.6...0.7

100 s: (0.6...1.0)

cm3 : 0.1Spread 100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 1000 Aneroid pressure h: 1100 Del.quantity: 31.0..32.0 Anerolu Del.quantity

: (30.0...33.0) cm3 : 2.50 Spread

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 9,0...9,4
Speed rpm : 2500

4th rack travel in: 2950

: 0.00...1.00 Speed rpm

SET IDLE CONTROL LEVER

POSITION

Speed rpm

Rack travel in mm : 1,7...1,8

LOW IDLE 1

Control lever

position degrees: 12...16

Setting point w/out bumper spring

Speed rpm : 300 Rack travel in mm : 7.4 cm3 : 2.50 1000 s: (3.00) Spread Testing: rpm : 220 Speed STARTING FUEL DELIVERY Minimum rack trave: 9.00 Speed rpm: 300
Rack travel in mm: 7.30...7.50
Rack travel in mm: 2.50
Speed rpm: 620...720
Speed rpm: 1000
Maximum rack trave: 1.80 HIGH IDLE SET IDLE AUXILIARY SPRING Speed rpm : 360 Rack travel in mm : 5,80...6,00 1st version Aneroid pressure h: 1100 : (5,70...6,10) rpm : 2500 Speed TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000
Rack travel in m: 12.50...12.60
2nd speed rpm : 1400
Rack travel in m: 12.30...12.50
3rd speed rpm : 2200
Rack travel in m: 11.90...12.10 LOW IDLE Speed rpm : 300
Rack travel in mm : 7.30...7.50
Del.quantity cm3/ : 6.5...7.5
1000 s: (6.0...10.5) Aneroid/Altitude Compensator Test cm3 : 1.00 Spread 1000 s: (1.50) 1st version Settina SETTING/TESTING ELECTRONIC IDLE rpm : 1000 hPa : 950 Speed REGULATION (ELR) Pressure : 0.00...0.20 Rack travel mm Control lever at idle stop rpm : 315 Rack travel in mm : (12,5...13,9 Measurement 1/min: 1000 Del.quantity cm3/: -1000 s: (27,0...35,0) Speed 1st pressure hPa : 900 : 1,8 Current A Rack travel in m: 0.50...0.70 2nd pressure hPa : 750 Rack travel in m: 1.80...2.20 Control lever at full-load stop rpm : 2950 Speed Rack travel in mm: 0,0...1,0Current FUEL DELIVERY CHARACTERISTICS short-duration A: 3,0 Starting test rpm : 100 Speed Del.quantity cm3/: -min. 1000 s: 52,0 1st version Aneroid pressure h: 1100 : 1400 rpm Del.quantity cm3/: 31.0...32.5 1000 s: (30.0...33.5) Spread cm3 : 2.50 Remarks: Pin projection = 16.60...16.70 mm 1000 s: (3.00)
Aneroid pressure h: 1100
Speed rpm : 2200
Del.quantity cm3/: 33.5...35.5 CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF 1000 s: (32.5...36.5) -Control-lever position 49°, max. 0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE -Control lever at idle stop. With n = 300 1/min. and pu = 450 mbar, control rod must move quickly to control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1.
Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

ADJUSTMENT OF ACTIVE BUCKING DAMPING (ARD) + Control lever on full-load stop. At n = 1000 min. -1, I = 2.5 A, difference in delivery referenced to full-load delivery (9.0...11.0) ccm/1000 strokes. +

Note remarks

: MB 3,0 W20 : 17.02.89 Test sheet Edition : 06.09.88 : ISO-4113 Replaces

Test oil

Combination no. : 0 400 076 973

Injection pump

Pump designation : PES6M55C32ORS165 EP type number : 0 410 056 990

Governor

Governor design. : RSF315/2300M66-2 : 0 420 021 099 Governer no.

Customer-spec. information

Customer : DB

: 0M603-3.0 Engine

1st version kW : 80.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10

: (1.95...2.15)

Rack travel in mm : 20.00...22.00 Firing order : 1-5-3-6-2-4 Firing order

**B16** 

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 11.30...11.40

Del.quantity cm3/: 3.1...3.2

100 s: (3.0...3.3)

cm3 : 0.2Spread

100 s: (0.3)

2nd speed rpm : 300.0 Rack travel in mm : 5.6...5.8 Del.quantity cm3/: 0.6...0.7

100 s: (0.6...1.0)

Spread cm3 : 0.1 100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

: 31.5...32.5 Del.quantity 1000 : (30.5...33.5)

cm3 : 2.50 Spread

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 7,8...8,2

Speed rpm : 2500

4th rack travel in: 2950

: 0.00...1.00 Speed rpm

SET IDLE CONTROL LEVER

POSITION

: 1000 Speed rpm Rack travel in mm: 0,9...1,0

LOW IDLE 1

Control lever

position degrees: 13...17

Setting point w/out bumper spring

rpm : 300 Speed

Rack travel in mm: 5.7 STARTING FUEL DELIVERY Testing: Speed : 220 rpm : 100 rpm Speed Del.quantity cm3/: 55.0...0.0 Minimum rack trave: 7.00 1000 s: (55.0...0.0) Rack travel in mm : 20.10...0.00 : 300 Speed rpm Rack travel in mm : 5.60...5.80 Rack travel in mm : 1.50 Speed : 620...720 HIGH IDLE rpm : 1000 Speed rpm Maximum rack trave: 1.00 1st version SET IDLE AUXILIARY SPRING rpm : 360 Speed Rack travel in mm : 4,20...4,40 : (4,10...4,50) TORQUE CONTROL Torque control curve - 1st version LOW IDLE rpm : 1000 1st speed Rack travel in m: 11.30...11.40 Speed rpm : 300 Rack travel in mm : 5.60...5.80 2nd speed rpm : 1800 Del.quantity cm3/: 6.5...7.5 1000 s: (6.0...10.0) Spread cm3 : 1.00 1000 s: (1.50) Rack travel in m: 10.90...11.10 3rd speed rpm : 2200 Rack travel in m: 10.60...10.80 Aneroid/Altitude Compensator Test SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR) 1st version Control lever at idle stop Setting rpm : 315 Speed Rack travel in mm : (12,6...14,0) Speed rpm : 1000 hPa : 930 : 1000 Del.quantity cm3/: -1000 s: (32,0...40,0) Pressure Rack travel mm : 0.10...0.50 : 1,8 Current A Control lever at full-load stop Measurement : 2950 Speed 1/min: 1000 Speed rpm Rack travel in mm : 0,0...1,0 1st pressure hPa : 840 Current Rack travel in m: 1.10...1.30 short-duration A: 3,0 2nd pressure hPa : 700 Starting test Rack travel in m: 2.30...2.70 rpm : 100 Speed Del.quantity cm3/: -min. 1000 s: 55,0 FUEL DELIVERY CHARACTERISTICS Remarks: 1st version Speed : 1800 rpm Del.quantity cm3/: 34.0...35.5 1000 s: (33.0...36.5) Spread cm3 : 2.50 1000 s: (3.00) Speed rpm : 2200 Pin projection = 16.60...16.70 mm Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° Del.quantity cm3/: 33.5...35.5 (19.2...19.8°) angular displacement of 1000 s: (32.5...36.5) cm3 : 2.50 1000 s: (3.00) cam following start of delivery of cylinder no. 1. Spread Difference in start of delivery between max. and min. value = max. 1° angular

## displacement of cam

CHECKING THE PNEUMATIC SHUTOFF BOX -Control lever up against idle stop. At n = 290 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF
-Control-lever position 49°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

ADJUSTING ACTIVE JOLT DAMPING (ARD)
Control lever at full-load stop. With
n= 1000 1/min., I = 2.5 A, control-rodtravel reduction = 2.25...2.55 mm

#### Note remarks

: MB 3,0 W10 : 17.02.89 : 30.03.87 Test sheet Edition Replaces : ISO-4113 Test oil

Combination no. : 0 400 076 975

Injection pump

Pump designation : PES6M55C32ORS156 EP type number : 0 410 056 995

Governor

Governor design. : RSF315/2300M66 : 0 420 021 066 Governer no.

Customer-spec. information

Customer : DB

Engine : 0M603-3.0

1st version kW : 80.0

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening |

: 172...175 pressure, bar

Test lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 2.00...2.10 : (1.95...2.15) Prestroke mm

Rack travel in mm : 20.00...22.00 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.00 (1.60)

Time to cyl. no. : 1

## BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 11.30...11.40

Del.quantity cm3/: 3.1...3.2

100 s: (3.0...3.3)

Spread cm3 : 0.2

100 s: (0.3)

rpm : 300.0 2nd speed Rack travel in mm : 6.1...6.3 Del.quantity cm3/: 0.6...0.7

100 s: (0.6...1.0)

cm3 : 0.1 Spread 100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

: 31.5...32.5 Del.quantity 1000 : (30.5...33.5)

: 2.50 Spread cm3

1000 : (3.00)

#### RATED SPEED

1st version Control lever

position degrees: 50...0 3rd rack travel in: 7,9...9,3 Speed rpm : 2500

4th rack travel in: 2950

Speed : 0.00...1.00 rpm

# SET IDLE CONTROL LEVER

**POSITION** 

Speed : 1000 man Rack travel in mm : 0,9...1,0

LOW IDLE 1

Control lever

position degrees: 13...17 Setting point w/out bumper spring

Speed man

Rack travel in mm: 6.2 Testing: Speed rpm: 220 Minimum rack trave: 7.00 Speed Speed rpm: 300
Rack travel in mm: 6.10...6.30
Rack travel in mm: 1.50 : 600...700 Speed rom : 1000 Speed rpm Maximum rack trave: 1.00 SET IDLE AUXILIARY SPRING rpm : 360 Rack travel in mm : 4,20...4,40 : (4,10...4,50) TORQUE CONTROL Torque control curve - 1st version rpm : 1000 1st speed Rack travel in m: 11.30...11.40 rpm : 1800 2nd speed Rack travel in m: 10.80...11.00 3rd speed rpm : 2200 Rack travel in m: 10.50...10.70 FUEL DELIVERY CHARACTERISTICS 1st version Speed : 1800 rpm Del.quantity cm3/: 34.0...35.5 1000 s: (33.0...36.5) cm3 : 2.50 Spread 1000 s: (3.00) Speed rpm : 2200
Del.quantity cm3/ : 33.5...35.5
1000 s: (32.5...36.5)
Spread cm3 : 2.50 1000 s: (3.00) STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 55.0...0.0 1000 s: (55.0...0.0) Rack travel in mm: 20.10...0.00 HIGH IDLE 1st version : 2500 Speed rpm Rack travel in mm : 7.90...8.30 Del.quantity cm3/: 22.0...26.0 1000 s: (21.0...27.0) Spread cm3 : 2.50 1000 s: (3.00)

## LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.10...6.30
Del.quantity cm3/ : 6.5...7.5
1000 s: (6.0...10.0)

cm3 : 1.00 Spread 1000 s: (1.50)

SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop Speed rpm : 315 Rack travel in mm : (12,0...13,4)

Current A : 1,8 Control lever at full-load stop : 2950 Speed rpm

Rack travel in mm : 0,0...1,0

Current

short-duration A : 3,0

Starting test Speed rpm: 100 Del.quantity cm3/: - min. 1000 s: 55,0

## Remarks:

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF -Control-lever position 49°, max.

0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.

Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX -Control lever up against idle stop. At n = 290 1/min and pu = 450 mbar control rod must move briskly to
control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Difference in start of delivery between max. and min. value = max. 1° angular

displacement of cam ADJUSTMENT OF ACTIVE BUCKING DAMPING (ARD) Control lever on full-load stop. At n = 1000 min. -1, I = 2.5 A, difference in delivery referenced to full-load delivery (8.8...10.8) ccm/1000 strokes.

Note remarks

: MB 3.0 W21 : 17.02.89 Test sheet Edition Replaces : 06.09.88 : ISO-4113 Test oil

Combination no. : 0 400 076 976

Injection pump

Pump designation : PES6M55C32ORS157-1 EP type number : 0 410 056 991

Governor

Governor design. : RSF450/2300M68 : 0 420 021 095 Governer no.

Customer-spec. information

Customer : DB

: 0M603A (3.0L) Engine

1st version kW : 100.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 2.20...2.30 Prestroke mm

: (2.15...2.35)

Rack travel in mm : 20.00...22.00 Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - 0 : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 13.10...13.20

Del.quantity cm3/: 4.6...4.7

100 s: (4.5...4.8)

Spread cm3 : 0.2

100 s: (0.3)

rpm : 450.02nd speed Rack travel in mm : 5.4...5.6 Del.quantity cm3/: 0.5...0.6 100 s: (0.5...0.9)

cm3 : 0.1 Spread

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000 Aneroid pressure h: 1850

: 46.5...47.5 : (45.5...48.5) Del.quantity 1000

: 2.50 Spread cm3

: (3.00) 1000

RATED SPEED

1st version

Control lever

position degrees: 50...0 3rd rack travel in: 8,5...8,9 Speed rpm : 2500 4th rack travel in: 2950

: 0.00...1.00 Speed rpm

SET IDLE CONTROL LEVER

POSITION

rpm Rack travel in mm : 1,9...2,0

LOW IDLE 1 Control lever

position degrees: 10...14

Setting point w/out bumper spring

**B22** 

cm3 : 2.50 1000 s: (3.00) Speed rpm Spread Rack travel in mm: 5.5 Aneroid pressure h: 1050 Testing: Speed : 250 rpm Minimum rack trave: 13.00 Speed rpm : 450
Rack travel in mm : 5.40...5.60
Rack travel in mm : 2.50 : 620...720 Speed man : 1000 Speed STARTING FUEL DELIVERY rom Maximum rack trave: 2.00 rpm : 100 SET IDLE AUXILIARY SPRING Speed Del.quantity cm3/: 52.0...0.0 1000 s: (52.0...0.0) Speed rpm : 500 Rack travel in mm : 4,30...4,50 Rack travel in mm : 20.10...0.00 : (4,20...4,60) TORQUE CONTROL HIGH IDLE Torque control curve – 1st version t speed rpm : 1000 Rack travel in m: 13.10...13.20 1st speed 1st version Aneroid pressure h: 1850 nd speed rpm : 1600 Rack travel in m: 12.40...12.60 : 2500 2nd speed Speed rpm Rack travel in mm : 8.50...8.90 Del.quantity cm3/: 29.0...33.0 rpm : 2200 3rd speed 1000 s: (28.0...34.0) Rack travel in m: 11.50...11.70 cm3 : 2.50 1000 s: (3.00) Spread Aneroid/Altitude Compensator Test LOW IDLE 1st version Setting Speed : 1000 rpm Pressure hPa : 1500 : 0.00...0.40 Rack travel mm 1000 s: (1.50) Measurement 1/min: 1000 SETTING PNUEUMATIC FAST IDLE Speed (ELA) 1st pressure hPa : 1050 Rack travel in m: 2.70...2.90 2nd pressure hPa : 750 rpm : 500 Speed Rack travel in m: 4.40...4.80 Rack travel in mm : (6,8...8,4) Del.quantity cm3/: -1000 s: (14,0...22,0) FUEL DELIVERY CHARACTERISTICS Vacuum hPa : 600 1st version Remarks: Aneroid pressure h: 1850 : 1600 Pin projection = 16.60...16.70 mm Speed · rpm Del.quantity cm3/: 45.5...47.0 1000 s: (44.5...48.0) cm3 : 2.50Spread CHECKING THE IDLE-SPEED AUXILIARY 1000 s: (3.00) SPRING CUTOFF Aneroid pressure h: 1850 -Control-lever position 49°, max.

0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.

Control-lever position 46.5°, : 2200 Speed rom Del.quantity cm3/: 44.0...46.0 1000 s: (43.0...47.0)

control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

CORRECTION OF INJECTED—FUEL QUANTITY—Set max. change plus/minus 0.75 mm control—rod travel at correction screw on ALDA pressure box.

Note remarks

: MB 3.0 W19 : 17.02.89 : 06.09.88 Test sheet Edition Replaces

: ISO-4113 Test oil

Combination no. : 0 400 076 977

Injection pump

Pump designation : PES6M55C32ORS165 EP type number : 0 410 056 990

Governor

Governor design. : RSF315/2300M60-7 : 0 420 021 092 Governer no.

Customer-spec. information Customer : DB

: 0M603-3.0; MJ:88 Engine

1st version kW : 75.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 2.00...2.10 Prestroke mm

(1.95...2.15)

Rack travel in mm : 20.00...22.00 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 800

Rack travel in mm : 12.70...12.80

Del.quantity cm3/: 3.0...3.1

100 s: (2.9...3.2)

cm3 : 0.2 Spread

100 s: (0.3)

rpm : 290.0 2nd speed Rack travel in mm: 6.9...7.1 Del.quantity cm3/: 0.5...0.6

100 s: (0.5...0.9) cm3 : 0.1

Spread

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 800 Speed

Aneroid pressure h: 1100

Del.quantity : 30.5...31.5 1090 : (29.5...32.5) Spread cm3 : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control Lever

position degrees: 0...50 3rd rack travel in: 9,2...9,6 Speed rpm : 2500

4th rack travel in: 2950

: 0.00...1.00 Speed rpm

SET IDLE CONTROL LEVER

**POSITION** 

rom

Rack travel in mm : 1,9...2,0

LOW IDLE 1

Control lever

position degrees: 10...14

Setting point w/out bumper spring

**B25** 

Speed rpm : 290 Rack travel in mm : 7.0 cm3 : 2.50 1000 s: (3.00) Spread Testing: Speed rpm : 220 Minimum rack trave: 7.00 STARTING FUEL DELIVERY : 290 Speed rpm Rack travel in mm : 6.90...7.10
Rack travel in mm : 2.50 rpm : 100 Speed Del.quantity cm3/: 52.0...0.0 1000 s: (52.0...0.0) : 630...730 rpm : 800 Rack travel in mm : 20.10...0.00 Speed rpm Maximum rack trave: 2.00 HIGH IDLE SET IDLE AUXILIARY SPRING Speed rpm : 360
Rack travel in mm : 5,50...5,70
: (5,40...5,80) 1st version Aneroid pressure h: 1100 Speed rpm : 2500
Rack travel in mm : 9.20...9.60
Del.quantity cm3/ : 22.0...26.0
1000 s: (21.0...27.0) TORQUE CONTROL Torque control curve - 1st version cm3 : 2.50 1000 s: (3.00) 1st speed rpm : 800 Spread Rack travel in m: 12.70...12.80 2nd speed rpm : 1600 Rack travel in m: 12.00...12.20

3rd speed rpm : 2200

Rack travel in m: 11.40...11.60 LOW IDLE Speed rpm: 290
Rack travel in mm: 6.90...7.10
Del.quantity cm3/: 5.5...6.5 Aneroid/Altitude 1000 s: (5.0...9.5) Compensator Test cm3 : 1.00 Spread 1000 s: (1.50) 1st version Setting SETTING/TESTING ELECTRONIC IDLE : 800 REGULATION (ELR) Speed rpm hPa : 950 Pressure : 0.00...0.20 Rack travel mm Control lever at idle stop Speed rpm : 315 Rack travel in mm : (13,0...14,4) Measurement 1/min: 800 Del.quantity cm3/: -1000 s: (28,0...36,0) Speed 1st pressure hPa : 900 : 1,8 Current A Control lever at full-load stop Rack travel in m: 0.50...0.70 2nd pressure hPa : 750 : 2950 rpm Rack travel in m: 1.80...2.20 Rack travel in mm : 0,0...1,0Current FUEL DELIVERY CHARACTERISTICS short-duration A: 3,0 Starting test Speed rpm : 100 Del.quantity cm3/: -min. 1000 s: 52,0 1st version Aneroid pressure h: 1100 Speed rpm : 1600 Del.quantity cm3/: 31.5...33.0 1000 s: (30.5...34.0) Remarks: Pin projection = 16.60...16.70 mm cm3 : 2.50 Spread 1000 s: (3.00) Aneroid pressure h: 1100 Speed rpm : 2200 Del.quantity cm3/: 32.0...34.0 1000 s: (31.0...35.0) CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF -Control-lever position 49°, max. 0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 290 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Note remarks

: MB 3,0 W4 : 17.02.89 Test sheet Edition : 02.86 Replaces : ISO-4113 Test oil

Combination no. : 0 400 076 986

Injection pump

Pump designation : PES6M55C32ORS157-1

EP type number : 0 410 056 991

Governor

Governor design. : RSF315/2300M65 : 0 420 021 060 Governer no.

Customer-spec. information

Customer : DB

Engine : 0M603A Touring

1st version kW : 110.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 2.20...2.30 Prestroke mm

: (2.15...2.35)

Rack travel in mm : 20.00...22.00

Firing order : 1-5-3-6-2-4 Phasing : 0-60-120-180-240-300

: 0.00 (1.00) Tolerance + - 0

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 13.90...14.00

Del.quantity cm3/: 5.1...5.2

100 s: (5.0...5.3)

cm3 : 0.2Spread

100 s: (0.3)

rpm : 290.0 2nd speed Rack travel in mm: 5.3...5.5 Del.quantity cm3/: 0.5...0.6

100 s: (0.5...0.9)

cm3 : 0.1 Spread

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed Aneroid pressure h: 1850

: 51.0...52.0 Del.quantity

1000 : (50.0...53.0)

: 2.50 Spread cm3

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0
3rd rack travel in: 8,1...8,5
Speed rpm : 2500

4th rack travel in: 2950

: 0.00...1.00 Speed rpm

SET IDLE CONTROL LEVER

POSITION

rpm

Rack travel in mm : 1,7...1,8

LOW IDLE 1

Control Lever

position degrees: 8...12

Setting point w/out bumper spring

**B28** 

Speed rpm: 290 Rack travel in mm: 5.4  Testing: Speed rpm: 200 Minimum rack trave: 7.00 Speed rpm: 290 Rack travel in mm: 5.305.50 Rack travel in mm: 2.50 Speed rpm: 510610 Speed rpm: 1000 Maximum rack trave: 1.80	Spread cm3 : 2.50 1000 s: (3.00) Aneroid pressure h: 1050 Speed rpm : 1000 Del.quantity cm3/ : 33.034.0 1000 s: (32.035.0) Spread cm3 : 2.50 1000 s: (3.00)
SET IDLE AUXILIARY SPRING Speed rpm : 360 Rack travel in mm : 4,204,40 : (4,104,50)	Speed rpm : 100 Del.quantity cm3/ : 52.00.0 1000 s: (52.00.0) Rack travel in mm : 20.100.00
TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 13.9014.00 2nd speed rpm : 1600 Rack travel in m: 13.2013.40 3rd speed rpm : 2200 Rack travel in m: 12.3012.50  Aneroid/Altitude Compensator Test	HIGH IDLE   1st version   Aneroid pressure h: 1850   Speed   rpm : 2500   Rack travel in mm : 8.108.50   Del.quantity cm3/ : 29.033.0   1000 s: (28.034.0)   Spread   cm3 : 2.50   1000 s: (3.00)   LOW IDLE
1st version Setting Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.500.90	Speed rpm : 290 Rack travel in mm : 5.305.50 Del.quantity cm3/ : 5.56.5 1000 s: (5.09.5) Spread cm3 : 1.00 1000 s: (1.50)
Measurement Speed 1/min: 1000 1st pressure hPa: 1050 Rack travel in m: 3.904.10	SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)  Control lever at idle stop
2nd pressure hPa : 750 Rack travel in m: 5.806.20 FUEL DELIVERY CHARACTERISTICS	<pre>Speed rpm : 315 Rack travel in mm : (12,814,2) Del.quantity cm3/: - 1000 s: (42,049,0) Current A : 1,8 Control lever at full-load stop</pre>
1st version Aneroid pressure h: 1850 Speed rpm : 1600 Del.quantity cm3/: 50.051.5	Speed rpm: 2950 Rack travel in mm: 0,01,0 Current short-duration A: 3,0 Starting test Speed rpm: 100 Del.quantity cm3/:- min. 1000 s: 55,0  Remarks: Pin projection = 16.6016.70 mm

CORRECTION OF INJECTED—FUEL QUANTITY—Set max. change plus/minus 0.75 mm control—rod travel at correction screw on ALDA pressure box.

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF
-Control-lever position 49°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 290 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1D77 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1.

Note remarks

Test sheet Edition : MB 3,0 W3 : 17.02.89 : 02.86 Replaces Test oil : ISO-4113

Combination no. : 0 400 076 987

Injection pump

Pump designation : PES6M55C32ORS157 : 0 410 056 993 EP type number

Governor

Governor design. : RSF315/2300M64-2 : 0 420 021 059 Governer no.

Customer-spec. information

Customer : DB

Engine : 0M603A

1st version kW : 110.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 2.20...2.30 Prestroke mm : (2.15...2.35) Rack travel in mm : 20.00...22.00

Firing order : 1-5-3-6-

**CO3** 

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

rpm : 10001st speed

Rack travel in mm : 13.90...14.00

Del.quantity cm3/: 5.1...5.2

100 s: (5.0...5.3)

cm3 : 0.2Spread

100 s: (0.3)

rpm : 290.0 2nd speed Rack travel in mm : 5.3...5.5 Del.guantity cm3/: 0.5...0.6

100 s: (0.5...0.9)

Spread cm3 : 0.1

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed Aneroid pressure h: 1850

Anerou Del.quantity 1000 : 51.0...52.0 : (50.0...53.0) : 2.50

Spread cm3

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0 3rd rack travel in: 8,1...8,5 Speed rpm : 2500

4th rack travel in: 2950

: 0.00...1.00 Speed rpm

SET IDLE CONTROL LEVER

POSITION

: 1000 rpm Rack travel in mm : 1,7...1,8

LOW IDLE 1 Control lever

position degrees: 8...12

Setting point w/out bumper spring

Speed rpm : 2 Rack travel in mm : 5		Spread	cm3:	(3.00)
Testing: Speed rpm : 2 Minimum rack trave: 7 Speed rpm : 2 Rack travel in mm : 5 Rack travel in mm : 2	7.00 190 5.305.50	Aneroid pres Speed Del.quantity Spread	rpm : / cm3/ :	1000 33.034.0 (32.035.0) 2.50
Speed rpm : 5	110610 000 +	STARTING FUE	EL DELIVE	ERY
SET IDLE AUXILIARY SP Speed rpm : 3 Rack travel in mm : 4 : (	60	Speed Del.quantity Rack travel	1000 s:	100 52.00.0 (52.00.0) 20.100.00
TORQUE CONTROL Torque control curve 1st speed rpm : 1 Rack travel in m: 1 2nd speed rpm : 1 Rack travel in m: 1 3rd speed rpm : 2 Rack travel in m: 1 Aneroid/Altitude Compensator Test	000 3.9014.00 600 3.2013.40	Del.quantity Spread	rpm : in mm : cm3/:	2500 8.108.50 29.033.0 (28.034.0) 2.50
		LOW IDLE Speed Rack travel Del.quantity Spread	in mm : / cm3/ :	5.56.5 (5.09.5) 1.00
Measurement Speed 1/min: 1 1st pressure hPa: 1	+	SETTING/TEST REGULATION (		CTRONIC IDLE
Rack travel in m: 3 2nd pressure hPa : 7 Rack travel in m: 5	.904.10 <del> </del> 50 +	Control leve Speed Rack travel Del.quantity	rpm :	315 (12,814,2)
FUEL DELIVERY CHARACT	ERISTICS +	Current A Control leve	1000 s: r at ful	(42,049,0) 1,8 .l-load stop
1st version Aneroid pressure h: 18 Speed rpm: 16 Del.quantity cm3/: 50 1000 s: 68 Spread cm3 : 2 1000 s: 68 Aneroid pressure h: 18 Speed rpm: 28	600 0.051.5 49.052.5) .50 3.00)	Speed Rack travel Current short-durat Starting tes Speed Del.quantity	rpm : in mm : ion A : t rpm :	2950 0,01,0 3,0 100
Del.quantity cm3/: 44		Remarks:	on = 16	60 16 70 mm

CORRECTION OF INJECTED-FUEL QUANTITY -Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

CHECKING THE IDLE—SPEED AUXILIARY SPRING CUTOFF

-Control—lever position 49°, max.

0.2 mm control—rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. Control—lever position 46.5°, control—rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 290 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1.

Testing and adjusting the control-rod-travel sensor with evaluation circuit R2.1.3

Receiving inspection
Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 3.230...3.310 (3.190...3.350) V must be displayed on the digital voltmeter.

Adjustment of the control-rod travel sensor
At a speed of 1000 1/min, set fuel delivery at 23.0...24.0 (22.0...25.0) ccm/1000 strokes with control lever.
Shift control-rod-travel sensor until U = 2.095...2.105 (2.098...2.102) V is indicated. Tighten fastening screws

with 1...2 Nm. Control lever to full-load stop; voltage value of 3.230... 3.310 V must be attained.

Note remarks

: MB 3,0 W5 : 17.02.89 Test sheet Edition Replaces : 12.09.86 : ISO-4113 Test oil

Combination no. : 0 400 076 988

Injection pump

Pump designation : PES6M55C32ORS156 EP type number : 0 410 056 995

Governor

Governor design. : RSF315/2300M60-4 : 0 420 021 057 Governer no.

Customer-spec. information

Customer : DB

: 0M603-3.0 Engine

1st version kW : 80.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Openina .

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10

: (1.95...2.15)

Rack travel in mm : 20.00...22.00 : 1-5-3-6-2-4

Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 11.30...11.40

Del.quantity cm3/: 3.1...3.2

100 s: (3.0...3.3)

cm3 : 0.2Spread

100 s: (0.3)

2nd speed rpm : 290.0 Rack travel in mm : 5.4...5.6

Del.quantity cm3/: 0.5...0.6 100 s: (0.5...0.9)

Spread cm3 : 0.1

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed

: 31.5...32.5 : (30.5...33.5) Del.quantity 1000

: 2.50 Spread cm3

: (3.00) 1000

RATED SPEED

1st version

Control lever

position degrees: 50...0
3rd rack travel in: 7,80...8,20
Speed rpm : 2500

4th rack travel in: 2950

: 0.00...1.00 Speed rom

SET IDLE CONTROL LEVER POSITION

: 1000 Speed rom

Rack travel in mm : 0,9...1,0

LOW IDLE 1

Control lever

position degrees: 13...17

Setting point w/out bumper spring

rpm : 290 Speed

**CO6** 

Rack travel in mm : 5.5 STARTING FUEL DELIVERY Testina: Speed rpm : 100
Del.quantity cm3/ : 55.0...0.0
1000 s: (55.0...0.0)
Rack travel in mm : 20.10...0.00 Speed rpm : 220 Minimum rack trave: 7.00 Speed rpm : 290 Rack travel in mm : 5.40...5.60 Rack travel in mm: 1.50 : 620...720 Speed HIGH IDLE rpm : 1000 Speed rom Maximum rack trave: 1.00 1st version Speed rpm : 2500 Rack travel in mm : 7.80...8.20
Del.quantity cm3/ : 22.0...26.0
1000 s: (21.0...27.0)
Spread cm3 : 2.50
1000 s: (3.00) SET IDLE AUXILIARY SPRING : 360 Speed rpm Rack travel in mm : 4,20...4,40 : (4,10...4,50) TORQUE CONTROL Torque control curve - 1st version LOW IDLE : 1000 1st speed rpm Rack travel in m: 11.30...11.40 Speed rpm Rack travel in mm : 5.40...5.60 : 1800 2nd speed rpm Del.quantity cm3/: 5.5...6.5 1000 s: (5.0...9.5) Rack travel in m: 10.90...11.10 3rd speed rpm : 2200 cm3 : 1.00 1000 s: (1.50) Rack travel in m: 10.60...10.80 Spread Aneroid/Altitude Compensator Test SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR) 1st version Control lever at idle stop Setting rpm : 315 Speed Rack travel in mm : (12,6...14,0) : 1000 Speed rpm Del.quantity cm3/: -1000 s: (32,0...40,0) hPa : 930 Pressure Rack travel mm : 0.10...0.50 : 1,8 Current A Control lever at full-load stop Speed rpm : 2950 Measurement 1/min: 1000 Speed Rack travel in mm : 0,0...1,0 1st pressure hPa : 840 Current Rack travel in m: 1.10...1.30 short-duration A: 3,0 2nd pressure hPa : 700 Starting test Rack travel in m: 2.30...2.70 Speed rpm Del.quantity cm3/: -min. 1000 s: 55,0 FUEL DELIVERY CHARACTERISTICS Remarks: 1st version : 1800 Speed rpm Del.quantity cm3/: 34.0...35.5 1000 s: (33.0...36.5) Pin projection = 16.60...16.70 mm cm3 : 2.50 1000 s: (3.00) Spread Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1.

Difference in start of delivery between may and min. value = may 1° angular : 2200 rpm Del.quantity cm3/: 33.5...35.5 1000 s: (32.5...36.5) : 2.50 Spread cm3 1000 s: (3.00) max. and min. value = max. 1° angular

# displacement of cam

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 290 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.

D.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.

Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

Note remarks

: MB 3,0 W2 : 17.02.89 Edition : 02.86 Replaces

: ISO-4113 Test oil

: 0 400 076 992 Combination no.

Injection pump

Pump designation : PES6M55C32ORS157 EP type number : 0 410 056 993

Governor

Governor design. : RSF315/2300M64 : 0 420 021 044 Governer no.

Customer-spec. information

Customer : DB

Engine : 0M603A

1st version kW : 110.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

: 1 680 750 014 Test lines

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 2.20...2,30 Prestroke mm

: (2.15...2.35)

Rack travel in mm : 20.00...22.00 Firing order : 1-5-3-6-2-4

Test sheet

Phasing

: 0-60-120-180-240-300

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 13.90...14.00

Del.quantity cm3/ : 5.1...5.2

100 s: (5.0...5.3)

cm3 : 0.2Spread

100 s: (0.3)

rpm : 290.0 2nd speed Rack travel in mm : 5.3...5.5

Del.quantity cm3/: 0.5...0.6

100 s: (0.5...0.9)

cm3 : 0.1Spread 100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1850

Del.quantity : 51.0...53.0)

: 2.50 Spread cm3

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8,10...8,50
Speed rpm : 2500

4th rack travel in: 2950

: 0.00...1.00 Speed rpm

SET IDLE CONTROL LEVER

POSITION

rpm

Rack travel in mm : 1,7...1,8

LOW IDLE 1

Control Lever

position degrees: 8...12

Setting point w/out bumper spring

CD9

Speed rpm : 290 Rack travel in mm : 5.4  Testing: Speed rpm : 200 Minimum rack trave: 7.00 Speed rpm : 290 Rack travel in mm : 5.305.50 Rack travel in mm : 2.50	Spread cm3: 2.50 1000 s: (3.00) Aneroid pressure h: 1050 Speed rpm: 1000 Del.quantity cm3/: 33.034.0 1000 s: (32.035.0) Spread cm3: 2.50 1000 s: (3.00)
Speed rpm : 510610 Speed rpm : 1000 Maximum rack trave: 1.80	STARTING FUEL DELIVERY
SET IDLE AUXILIARY SPRING Speed rpm : 360 Rack travel in mm : 4,204,40 : (4,104,50)	Speed rpm : 100  Del.quantity cm3/ : 52.00.0  1000 s: (52.00.0)  Rack travel in mm : 20.100.00
TORQUE CONTROL	HIGH IDLE
Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 13.9014.00 2nd speed rpm : 1600 Rack travel in m: 13.2013.40 3rd speed rpm : 2200 Rack travel in m: 12.3012.50  Aneroid/Altitude Compensator Test	1st version Aneroid pressure h: 1850 Speed rpm : 2500 Rack travel in mm : 8.108.50 Del.quantity cm3/ : 29.033.0 1000 s: (28.034.0) Spread cm3 : 2.50 1000 s: (3.00)
compensator rest	LOW IDLE
1st version Setting Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.500.90	Speed rpm : 290 Rack travel in mm : 5.305.50 Del.quantity cm3/ : 5.56.5 1000 s: (5.09.5) Spread cm3 : 1.00 1000 s: (1.50)
Measurement Speed 1/min : 1000	SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)
1st pressure hPa : 1050 Rack travel in m: 3.904.10 2nd pressure hPa : 750 Rack travel in m: 5.806.20 FUEL DELIVERY CHARACTERISTICS	Control lever at idle stop Speed rpm : 315 Rack travel in mm : (12,814,2) Del.quantity cm3/: - 1000 s: (42,049,0)
	Current A : 1,8 Control lever at full-load stop
1st version Aneroid pressure h: 1850 Speed rpm : 1600 Del.quantity cm3/ : 50.051.5	Speed rpm : 2950 Rack travel in mm : 0,01,0 Current short-duration A : 3,0 Starting test Speed rpm : 100 Del.quantity cm3/:- min. 1000 s: 52,0  Remarks: Pin projection = 16.6016.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY -Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF -Control-lever position 49°, max. 0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX -Control lever up against idle stop. At n = 290 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Testing and adjusting the control-rodtravel sensor with evaluation circuit R2.1.3 Receiving inspection Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 3.230...3.310 (3.190...3.350) V must be displayed on the digital voltmeter.

Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 23.0...24.0 (22.0...25.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until U = 2.095...2.105 (2.098...2.102) V is indicated. Tighten fastening screws

with 1...2 Nm. Control lever to full-load stop; voltage value of 3.230... 3.310 V must be attained.

Note remarks

: MB 3,0 W : 06.04.88 Test sheet Edition : 09.03.87 Replaces Test oil : ISO-4113

: 0 400 076 994 Combination no.

Injection pump

Pump designation : PES6M55C32ORS156 EP type number : 0 410 056 995

Governor

Governor design. : RSF315/23G0M59-3 : 0 420 021 040 Governer no.

Customer-spec. information

Customer : DB

Engine : 0M603-3.0

1st version kW : 80.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 2.00...2.10 Prestroke mm

: (1.95...2.15)

Rack travel in mm : 20.00...22.00 Firing order : 1-5-3-6-2-

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 11.30...11.40

Del.quantity cm3/: 3.1...3.2

100 s: (3.0...3.3)

Spread cm3 : 0.2

100 s: (0.3)

rpm : 290.0 2nd speed Rack travel in mm: 5.4...5.6

Del.quantity cm3/: 0.5...0.6 100 s: (0.5...0.9)

cm3 : 0.1Spread

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed

: 31.5...32.5 : (30.5...33.5) Del.quantity

1000

: 2.50 Spread cm3 1000 : (3.00)

RATED SPEED

1st version Control lever

position degrees: 50...0

3rd rack travel in: 7,80...8,20

; 2500 Speed rpm

4th rack travel in: 2950

Speed : 0.00...1.00 rpm

SET IDLE CONTROL LEVER

**POSITION** 

: 10000 Speed rpm

Rack travel in mm: ,9...1,0

LOW IDLE 1

Control lever

position degrees: 13...17

Setting point w/out bumper spring

Speed rpm : 290

Rack travel in mm: 5.5 Testing: : 220 Speed rpm Minimum rack trave: 7.00 : 290 rom Rack travel in mm: 5.40...5.60
Rack travel in mm: 1.50
Speed rpm: 620...720 Speed rpm: 1000 Maximum rack trave: 1.00 SET IDLE AUXILIARY SPRING rpm : 360 Rack travel in mm : 4,20...4,40 : (4,10...4,50) TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 11.30...11.40 2nd speed rpm: 1800 Rack travel in m: 10.90...11.10 of speed rpm : 2200 3rd speed Rack travel in m: 10.60...10.80 FUEL DELIVERY CHARACTERISTICS 1st version Speed : 1800 rpm Del.quantity cm3/: 34.0...35.5 1000 s: (33.0...36.5) cm3 : 2.50 Spread 1000 s: (3.00) : 2200 Speed LDW Del.quantity cm3/: 33.5...35.5 1000 s: (32.5...36.5) Spread cm3 : 2.50 1000 s: (3.00) STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 55.0...0.0 1000 s: (55.0...0.0) Rack travel in mm : 20.10...0.00 HIGH IDLE 1st version Speed rpm : 2500 Rack travel in mm : 7.80...8.20 Del.quantity cm3/: 22.0...26.0 1000 s: (21.0...27.0) cm3 : 2.50Spread 1000 s: (3.00)

LOW IDLE

SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Starting test
Speed rpm : 100
Del.quantity cm3/: min. 1000 s: 55,0

Remarks:

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 290 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF
-Control-lever position 49°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

Note remarks

: KHD 1 g 40 Test sheet Edition : 24.02.89

Replaces

Test oil : ISO-4113

Combination no. : 0 400 463 158

Injection pump

Pump designation : PES3A80D410/3RS1324

: 0 410 483 017 EP type number

Governor

: RSV325...1150A8C705-Governor design.

1L

: 0 420 232 521 Governer no.

Customer-spec. information Customer

: F3L912 Engine

: 37.0 1st version kW : 2300 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

: 172...175 pressure, bar

Test Lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 1.90...2.00 : (1.85...2.05)

Rack travel in mm : 9.00...12.00

: 1- 3- 2 Firing order

Phasing : 0-120-240

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 1150

Rack travel in mm : 10.50...10.60

Del.quantity cm3/ : 5.4...5.5

100 s: (5.2...5.6)

Spread cm3 : 0.2

100 s: (0.4)

2nd speed rpm : 325.0

Rack travel in mm : 8.3...8.5

Del.quantity cm3/: 1.2...1.8 100 s: (1.0...1.9)

cm3 : 0.2 Spread

100 s: (0.3)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 5.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1150 Speed

: 54.0...55.0 Del.quantity : (52.5...56.5)

1000

Spread cm3

: (4.00) 1000

RATED SPEED

1st version

Control lever

position degrees: 54...62

Testing:

1st rack travel in: 9.50

rpm : 1190...1200 Speed

2nd rack travel in: 4.00

: 1225...1255 Speed man

3rd rack travel in: 4.00

Speed rpm : 1240...1270 4th rack travel in: 1420

rpm : 0.30...1.40Speed

LOW IDLE 1 Control Lever

position degrees: 19...27

Setting point w/out bumper spring

Speed rpm : 325 Rack travel in mm : 5.6

Testing:

Speed : 100 rpm Minimum rack trave: 19.50 rpm : 325 Speed

Rack travel in mm : 6.00...6.20

Rack travel in mm: 2.00

Speed : 410...470 rpm

TORQUE CONTROL

Torque control curve - 1st version

1st speed : 1150 rpm

Rack travel in m: 10.50...10.60

: 500 2nd speed rpm

Rack travel in m: 11.30...11.40

3rd speed rpm : 950

Rack travel in m: 10.80...11.00

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750 Del.quantity cm3/ : 51.5...53.5

1000 s: (49.5...55.5)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 9.50

rpm : 1190...1200 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 120.0...130.0

1000 s: (117.0...133.0)

Rack travel in mm : 19.50...21.00

Remarks:

: FENDT

APPLICATION

Tractor (tractor engines)

**C16** 

Note remarks

: KHD 1 g 41 : 24.02.89 Test sheet Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 400 463 159

Injection pump

Pump designation : PES3A80D410/3RS1324

EP type number : 0 410 483 017

Governor

Governor design. : RSV325...1095A8C657-

: 0 420 232 523 Governer no.

Customer-spec. information

Customer : KHD

Engine : F3L913 \*

1st version kW : 33.0 : 2190 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter

x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values

Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 1.90...2.00 Prestroke mm

: (1.85...2.05)

Rack travel in mm : 9.00...12.00 Firing order : 1- 3- 2

: 0-120-240 Phasina

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 800

Rack travel in mm : 10.70...10.80

Del.quantity cm3/ : 5.0...5.1

100 s: (4.9...5.3)

cm3 : 0.2Spread

100 s: (0.3)

rpm : 325.0 2nd speed Rack travel in mm: 8.3...8.5 Del.quantity cm3/: 1.2...1.8

100 s: (1.0...1.9) cm3 : 0.2 Spread

100 s: (0.3)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 5.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800

: 50.5...51.5 Del.quantity 1000 : (49.0...53.0)

: 2.50 Spread cm3

1000 : (3.50)

RATED SPEED

1st version

Control lever

position degrees: 51...59

Testina:

1st rack travel in: 8.70

rpm : 1145...1155 Speed

2nd rack travel in: 4.00

rpm : 1175...1205 Speed 3rd rack travel in: 4.00 Speed rpm : 1185...1215 4th rack travel in: 1350 Speed rpm : 0.30...1.40 LOW IDLE 1 Control lever position degrees: 19...27 Setting point w/out bumper spring Speed rpm : 325 Rack travel in mm : 5.5 Testing: Speed rpm : 100 Minimum rack trave: 19.50 : 325 rpm Rack travel in mm : 5.90...6.10 Rack travel in mm : 2.00 : 410...470 Speed rpm TORQUE CONTROL Torque control curve - 1st version st speed rpm : 1095 Rack travel in m: 9.70...9.80 1st speed rpm : 500 2nd speed Rack travel in m: 10.70...10.80 3rd speed rpm : 1015 Rack travel in m: 10.20...10.40 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 1095 Del.quantity cm3/ : 48.0...52.0 1000 s: (46.0...54.0) Speed rpm : 800 Del.quantity cm3/: 33.0...34.0 1000 s: (31.0...36.0) Spread cm3 : 2.501000 s: (-) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 8.70 rpm : 1145...1155 Speed STARTING FUEL DELIVERY Speed : 100 rpm Del.quantity cm3/: 120.0...130.0 1000 s: (117.0...133.0) Rack travel in mm : 19.50...21.00

Remarks: : FENDT

Note remarks

Test sheet : KHD 1 g 42 : 03.03.89 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 400 464 135

Injection pump

Pump designation : PES4A80D410/3RS1300

EP type number : 0 410 484 015

Governor

: RSV325...1150A8C657-Governor design.

: 0 420 232 522 Governer no.

Customer-spec. information Customer : KHD

: F4L912 Engine

1st version kW : 51.0 : 2300 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

Test Lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 1.90...2.00 Prestroke mm

: (1.85...2.05)

Rack travel in mm : 9.00...12.00

: 1-3-4-2 Firing order

: 0-90-180-270 Phasing

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm : 1150 1st speed

Rack travel in mm : 10.50...10.60

Del.quantity cm3/: 5.9...6.0

100 s: (5.8...6.2)

Spread cm3 : 0.2

100 s: (0.4)

2nd speed rpm : 325.0 Rack travel in mm : 7.5...7.7

Del.quantity cm3/: 0.9...1.5

100 s: (0.7...1.6)

cm3 : 0.2Spread 100 s: (0.3)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 5.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1150 Speed

. 59.5...60.5 1000 : (58.0...62.0) Del.quantity

: 2.50 cm3 Spread

1000 : (4.00)

RATED SPEED

1st version

Control lever

position degrees: 54...62

Testing:

1st rack travel in: 9.50 Speed rpm : 1190...1200

2nd rack travel in: 4.00

rpm : 1220...1250 Speed

3rd rack travel in: 4.00

Speed rpm : 1250...1280 4th rack travel in: 1420 Speed rpm : 0.30...1.40 LOW IDLE 1 Control lever position degrees: 20...28 Setting point w/out bumper spring Speed rpm : 325 Rack travel in mm : 7.1 Testing: Speed : 100 rpm Minimum rack trave: 19.50 Speed rpm: 325
Rack travel in mm: 7.50...7.70
Rack travel in mm: 2.00 : 455...515 Speed rpm TORQUE CONTROL Torque control curve - 1st version rpm : 1150 1st speed Rack travel in m: 10.50...10.60 2nd speed rpm : 500 Rack travel in m: 10.80...10.90 3rd speed rpm : 880 Rack travel in m: 10.60...10.70 FUEL DELIVERY CHARACTERISTICS 1st version rpm : 750 Speed Del.quantity cm3/: 54.0...56.0 1000 s: (52.0...58.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 9.50 rpm : 1190...1200 Speed STARTING FUEL DELIVERY Remarks: : FENDT APPLICATION Tractor (tractor engines)

C20

#### Note remarks

: KHD 19,0 q Test sheet : 12.09.86 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 400 640 113

Injection pump

Pump designation : PE12A95D610LS2453 EP type number : 0 410 690 998

Governor

Governor design. : RQV300...1250AB1223L

: 0 420 212 092 Governer no.

Customer-spec. information Customer : KHD

Engine : F12L413F

1st version kW : 282.0 : 2500 Rated speed

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Openina

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

## BEGINNING OF DELIVERY

: 2.00...2.10 Prestroke mm : (1.95...2.15) Rack travel in mm : 9.00...12.00

: 1- 4- 9- 8- 5- 2-Firing order

11- 10- 3- 6- 7- 12

: 0-15-60-75-120-135-180-195-240-255-300-Phasing

315

: 0.50 (0.75) Tolerance + - 0

Time to cyl. no. : 1

#### BASIC SETTING

1st speed rpm: 1250

Rack travel in mm : 10.40...10.50

Del.quantity cm3/: 9.4...9.6

100 s: (9.2...9.8)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 300.0 2nd speed Rack travel in mm : 6.4...6.6 Del.quantity cm3/ : 1.0...1.6 100 s: (0.7...1.8)

cm3 : 0.7 Spread 100 s: (0.9)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 200

: 0.70...0.80 travel mm

rpm : 500 2nd speed

: 2.60...2.80 travel mm

3rd speed : 900 rpm

: 5.60...5.80 travel mm

4th speed : 1300 rpm

: 8.60...8.70 travel mm

## GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 1275

Speed

Rack travel in mm : 15.20...17.80

#### FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Speed Del.quantity 1000 94.0...96.0 : (92.0...98.0)

3.50 Spread cm3

1000 : (6.00) RATED SPEED

1st version

Control lever

position degrees: 50...58

Testina:

1st rack travel in: 9.40

rpm : 1290...1300 Speed

2nd rack travel in: 4.50

Speed rpm : 1360...1390 3rd rack travel in: 0.00...1.00

4th rack travel in: 1500

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 14...22

Testing:

Speed rpm : 100 Minimum rack trave: 8.00

Speed rpm : 300

Rack travel in mm : 6.40...6.60

CONSTANT REGULATION

rom : 375...485 Speed

TORQUE CONTROL

Dimension a mm : 0.50

Torque control curve - 1st version

1st speed rpm : 1250
Rack travel in m: 10.40...10.50
2nd speed rpm : 500
Rack travel in m: 10.90...11.00

3rd speed rpm : 790

Rack travel in m: 10.70...10.90

4th speed rpm : 885

Rack travel in m: 10.40...10.60

START CUT-OUT

1/min: 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 650

Del.quantity cm3/: 93.5...96.5

1000 s: (91.0...99.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 9.40

rpm : 1290...1300 Speed

**C22** 

# STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 120.0...130.0 1000 s: (117.0...133.0)

Rack travel in mm : 13.50...14.20

Remarks:

Note remarks

Test sheet : KHD 12,7 p5 Edition : 07.02.89 : 5.8.88 Replaces Test oil : ISO-4113

Combination no. : 0 400 648 111

Injection pump

Pump designation : PE8A95D410LS2608 EP type number : 0 410 698 988

Governor

Governor design. : RQ300/1250AB987DL

: 0 420 202 277 Governer no.

Customer-spec. information Customer : KHD

: F8L413F Engine

1st version kW : 188.0 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

: 172...175 pressure, bar

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.00...2.10 Prestroke mm : (1.95...2.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 8- 7- 2- 6- 5-

Phasing : 0-45-90-135-180-225-

270-315 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rbm : 1259

Rack travel in mm : 10.40...10.50

Del.quantity cm3/: 9.6...9.8

100 s: (9.4...10.0)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 300.0 2nd speed Rack travel in mm: 6.5...6.7 Del.quantity cm3/: 0.9...1.5

100 s: (0.6...1.7)

cm3 : 0.5 Spread 100 s: (0.7)

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 550 Speed

Rack travel in mm : 15.60...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1250 Speed

96.5...98.5 Del.quantity 1000 : (94.5...100.5) cm3 : 3.50

Spread

1000 : (6.00)

RATED SPEED

1st version

Setting point:

rom Rack travel in mm : 16.0

Testing:

1st rack travel in: 9.40

rpm : 1295...1310 Speed

2nd rack travel in: 4.00

rpm : 1335...1365 Speed

**C23** 

4th rack travel in: 1450 rpm : 0.00...1.00 Speed LOW IDLE 1 Setting point w/out bumper spring : 300 rpm Rack travel in mm : 6.0 Testing: : 100 Speed rpm Minimum rack trave: 7.50 : 300 rpm Rack travel in mm: 5.90...6.10
Rack travel in mm: 2.00
Speed rpm: 345...385
Speed rpm: 550 Maximum rack trave: 1.00 TORQUE CONTROL Dimension a mm : 0.25 Torque control curve - 1st version : 1250 1st speed rpm Rack travel in m: 10.40...10.50 : 550 2nd speed rpm Rack travel in m: 10.90...11.00 3rd speed rpm : 850 Rack travel in m: 10.60...10.80 4th speed rpm : 970 Rack travel in m: 10.40...10.60 FUEL DELIVERY CHARACTERISTICS 1st version Speed : 650 rpm Del.quantity cm3/: 95.0...98.0 1000 s: (92.5...95.5) RACK STOP ADJUSTMENT rpm : 600 Speed **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 9.40 rpm : 1295...1310 Speed

Remarks:

Speed

LOW IDLE

STARTING FUEL DELIVERY

rpm : 100

1000 s: (117.0...133.0)

Del.quantity cm3/: 120.0...130.0

Note remarks

Test sheet : KHD 12,7 p2 : 07.02.89 Edition Replaces : 18.9.87

Test oil : ISO-4113

Combination no. : 0 400 648 141

Injection pump

Pump designation : PE8A95D410LS2608 : 0 410 698 988 EP type number

Governor

Governor design. : RQV300...1250AB1195L

: 0 420 212 172 Governer no.

Customer-spec. information Customer : KHD

: F8L413F Engine

1st version kW : 188.0 : 2500 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Openina

: 172...175 pressure, bar

Test lines : 1 680 750 014

Outside diameter

x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10

: (1.95...2.15)

Rack travel in mm : 9.00...12.00

C25

: 1-8-7-2-6-5-Firing order

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1250

Rack travel in mm : 10.40...10.50

Del.quantity cm3/: 9.6...9.8

100 s: (9.4...10.0)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 300.0 2nd speed Rack travel in mm: 6.5...6.7 Del.quantity cm3/: 0.9...1.5 100 s: (0.6...1.7)

cm3 : 0.5Spread

100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.20...1.30

2nd speed rpm : 500 travel mm

: 2.80...3.00 rpm : 1000 3rd speed

: 6.50...6.70 rpm : 1290 travel mm

4th speed

: 8.60...8.80 travel mm

rpm : 1375 5th speed

: 9.40...9.60 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm : 1275 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1250 Speed

Spread

: 3.50 cm3 1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 47...55

Testing:

1st rack travel in: 9.40

rpm : 1290...1300 Speed

2nd rack travel in: 4.50

Speed rpm : 1360...1390

4th rack travel in: 1500

Speed rpm : 0.30...1.00

LOW IDLE 1

Control lever

position degrees: 14...22

Rack travel in mm: 6.6

Testing:

rpm : 100 Speed Minimum rack trave: 8.00 rpm : 300

Rack travel in mm : 6.50...6.70

CONSTANT REGULATION

rpm : 375...485 Speed

TORQUE CONTROL

Dimension a mm : 0.50

Torque control curve - 1st version

1st speed rpm : 1250

Rack travel in m: 10.40...10.50

2nd speed rpm : 500

Rack travel in m: 10.90...11.00

3rd speed rpm : 850

Rack travel in m: 10.60...10.80

rpm : 950 4th speed

Rack travel in m: 10.40...10.60

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 650 Del.quantity cm3/ : 95.0...98.0 1000 s: (92.5...100.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.40

rpm : 1290...1300 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 120.0...130.0 1000 s: (117.0...133.0)

:

Remarks:

**C26** 

#### Note remarks

Test sheet : KHD 12,7 p6
Edition : 07.02.89
Replaces : 30.9.88
Test oil : ISO-4113

Combination no. : 0 400 648 142

Injection pump

Pump designation : PE8A95D410LS2608 EP type number : 0 410 698 988

Governor

Governor design. : RQV350...1250AB990-1

Governer no. : 0 420 212 182

Customer—spec. information Customer : KHD

Engine : F8L413F

1st version kW : 174.0 Rated speed : 2500

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening.

pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10

: (1.95...2.15)

Rack travel in mm : 9.00...12.00 Firing order : 1-8-7-2-6-5-4-3

Phasing : 0-45-90-135-180-225-

270-315 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

#### BASIC SETTING

1st speed rpm: 1225

Rack travel in mm : 10.00...10.10

Del.quantity cm3/: 8.9...9.1

100 s: (8.7...9.3)

Spread cm3: 0.3

100 s: (0.6)

cms : 0.5 100 s: (0.7)

# (B) Setting of injection pump with governor

#### GUIDE SLEEVE TRAVEL

1st speed rpm : 350 travel mm : 1.20...1.30 2nd speed rpm : 600 travel mm : 3.80...4.00

3rd speed rpm : 900 travel mm : 5.20...5.50

4th speed rpm : 1315

travel mm : 9.30...9.70

# GUIDE SLEEVE POSITION

Control-lever position Degree: -1

Speed rpm: 1225

Rack travel in mm : 15.20...17.80

# FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 1225

Del.quantity : 89.0...91.0 1000 : (87.0...93.0)

Spread cm3 : 3.50

1000 : (6.00)

#### RATED SPEED

1st version Control lever

position degrees: 61...69

Testing:

1st rack travel in: 9.00

rpm : 1265...1275 Speed

2nd rack travel in: 4.00

rpm : 1300...1330 Speed

4th rack travel in: 1450

Speed rpm : 0.00...1.00

LOW IDLE 1 Control Lever

position degrees: 9...17

Testing:

Speed : 100 rpm Minimum rack trave: 8.00 rpm : 350 Speed

Rack travel in mm : 6.40...6.60

CONSTANT REGULATION

rpm : 370...480 Speed

TORQUE CONTROL

Dimension a mm : 0.40

Torque control curve - 1st version 1st speed rpm : 1225

Rack travel in m: 10.00...10.10

rpm : 500 2nd speed

Rack travel in m: 10.40...10.50

3rd speed rpm : 970

Rack travel in m: 10.20...10.40

4th speed rpm : 1080

Rack travel in m: 9.80...10.00

START CUT-OUT

Speed 1/min: 270 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

: 700 Speed rpm

Del.quantity cm3/: 90.5...93.5 1000 s: (88.0...96.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 9.00

rpm : 1265...1275 Speed

**C28** 

#### STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 120.0...130.0 1000 s: (117.0...133.0) Rack travel in mm : 14.70...15.30

Remarks:

Note remarks

: KHD 15,8 L : 07.02.89 Test sheet Edition : 5.84 Replaces

: ISO-4113 Test oil

Combination no. : 0 400 649 196

Injection pump

Pump designation : PE10A95D610/4LS2452

EP type number : 0 410 699 998

Governor Governor design. : RQV750AB996L : 0 420 212 091 Governer no.

Customer-spec. information

Customer : KHD

: F10L413F Engine

: 162.0 1st version kW : 1500 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder

assembly : 0 681 343 009

**Opening** 

pressure, bar : 172...175

: 1 680 750 014 Test lines

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.00...2.10 Prestroke mm

: (1.95...2.15)

Rack travel in mm : 9.00...12.00

: 1-10- 9- 4- 3- 6-5- 8- 7- 2 Firing order

Phasing : 0-27-72-99-144-171-216-243-288-315

: 0.50 (0.75) Tolerance + - 0

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 710

Rack travel in mm : 10.00...10.10

Del.quantity cm3/: 9.6...9.8

100 s: (9.4...10.0)

cm3 : 0.3Spread

100 s: (0.6)

2nd speed rpm : 300.0 Rack travel in mm : 5.6...5.8

Del.quantity cm3/: 0.4...0.9 100 s: (0.1...1.1)

Spread cm3 : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 760 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 710 Speed

: 96.0...98.0 Del.quantity

1000 : (94.0..100.0) cm3 : 3.00

Spread 1000 : (6.00)

RATED SPEED

1st version

Setting point:

Speed : 760 rpm

Rack travel in mm : 16.5

Testing:

1st rack travel in: 9.70

rpm : 750...755 Speed

2nd rack travel in: 4.00

rpm : 773...788 Speed

D01

#### START CUT-OUT

Speed 1/min: 660 (680)

#### BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 9.70 Speed rpm : 750...755

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 116.5 1000 s: (113.5)

Rack travel in mm : 13.90...14.30

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

### **APPLICATION**

Compressor

Generator set

Note remarks

Test sheet : MAN 15,0 d1 : 10.02.89 Edition

: 4.86 Replaces : ISO-4113 Test oil

Combination no. : 0 400 649 240

Injection pump

Pump designation : PE10A95D520/5LS2604

EP type number : 0 410 699 993

Governor

Governor design. : RQV250...1150AB1189R

Governer no. : 0 420 213 102

Customer-spec. information Customer : MAN

: D2840 ME Engine

: 270.0 1st version kW : 2300 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Openina

pressure, bar : 172...175

: 1 680 750 003 Test Lines

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 1.70...1.80 Prestroke mm

: (1.65...1.85)

Rack travel in mm : 9.00...12.00

: 0-45-72-117-144-189-216-261-288-333 Phasina

: 10- 9- 4- 1- 8- 7-

6-3-5-2

: 0.50 (0.75) Tolerance + - 0

Time to cyl. no. : 10

BASIC SETTING

Firing order

1st speed rpm: 1150

Rack travel in mm : 13.00...13.10

Del.guantity cm3/: 12.8...13.0

100 s: (12.2...12.8)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 250.02nd speed Rack travel in mm: 6.9...7.1 Del.quantity cm3/: 1.0...1.6

100 s: (0.7...1.8)

Spread cm3 : 0.3100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

: 2.00...2.50 travel mm

rpm : 850 2nd speed

: 5.75...6.00 travel mm : 1150

3rd speed rpm

travel mm : 7.50...7.90 : 1300 4th speed rpm

: 9.25...9.75 travel mm

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 1230 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

: 1150 Speed rpm

128.0...130.0 Del.quantity : (122.5...128.5) : 3.50 1000

Spread cm3

1000 : (6.00)

003

RATED SPEED

1st version Control lever

position degrees: 58...66

Testing:

1st rack travel in: 12.00 Speed rpm : 1190...1200

2nd rack travel in: 4.00

rpm : 1280...1310 Speed

4th rack travel in: 1400

rpm : 0.00...1.00Speed

LOW IDLE 1

Control lever

position degrees: 8...16

Testing:

: 100 Speed rpm

: 250 Speed rpm

Rack travel in mm : 6.90...7.10

Rack travel in mm : 2.00

Speed rpm : 400...460

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1150

Rack travel in m: 13.00...13.10

2nd speed rpm : 500

Rack travel in m: 13.00...13.20

START CUT-OUT

1/min: 170 (190) Speed

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 12.00

rpm : 1190...1200 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Rack travel in mm : 15.90...16.50

Remarks:

Note remarks

Test sheet : KHD 12,7 r1 Edition : 07.02.89

Replaces

Test oil : ISO-4113

Combination no. : 0 400 678 040

Injection pump

Pump designation : PE8A95D410LS2451 EP type number : 0 410 698 992

Governor

: RSV300...1325A8C1002 Governor design.

: 0 420 232 310 Governer no.

Customer-spec. information

Customer : KHD

: F8I 413F Engine

1st version kW : 188.0 : 2650 Rated speed : 157.0 2nd version : 2300 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

: 172...175 pressure, bar

: 1 680 750 014 Test lines

Outside diameter

x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.00...2.10 : (1.95...2.15) Prestroke mm

Rack travel in mm : 9.00...12.00

: 1- 8- 7- 2-4- 3 Firing order 6- 5-

: 0-45-90-135-180-225-Phasina

270-315

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1325 1st speed

Rack travel in mm : 9.70...9.80

Del.quantity cm3/: 9.1...9.3

100 s: (8.9...9.5)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 300.02nd speed Rack travel in mm: 5.9...6.1 Del.quantity cm3/: 0.9...1.5

100 s: (0.6...1.7) cm3 : 0.5 Spread

100 s: (0.9)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800

Rack travel in mm : 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1325

: 91.5...93.5 Del.quantity 1000 : (89.5...95.5)

: 3.00 Spread cm3 1000 : (6.00)

2nd version

Speed rpm : 1150 Del.quantity cm3/ : 83.0...85.0

1000 s: (81.0...87.0)

: 3.00 Spread cm3

1000 s: (3.00)

RATED SPEED

1st version

Control lever position degrees: 59...67 Testing: 1st rack travel in: 8.70 Speed rpm: 1365...1375 2nd rack travel in: 4.00 Speed rpm : 1390...1420 4th rack travel in: 1575 rpm : 0.30...1.70Speed LOW IDLE 1 Control lever position degrees: 16...24 Setting point w/out bumper spring rpm : 300 Speed Rack travel in mm : 6.0 Testing: Speed rpm : 100 Minimum rack trave: 19.00 Speed rpm : 300 Rack travel in mm: 5.90...6.10
Rack travel in mm: 2.00
Speed rpm: 310...370 rpm : 700 Speed Maximum rack trave: 1.00 SET IDLE AUXILIARY SPRING Rack travel in mm : 2.00 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1325 Rack travel in m: 9.70...9.80 2nd speed rpm : 500 Rack travel in m: 10.00...10.10 BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 8.70 Speed rpm : 1365...1375 STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 116.5...127.5 1000 s: (113.5...130.5) Rack travel in mm: 14.00...14.40 HIGH IDLE 1st version Rack travel in mm : 3.90...4.10 Spread cm3 : 10.00

Remarks:

006

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MB 3,8 q Edition : 10.02.89 Replaces Test oil : ISO-4113 Combination no. : 0 400 844 048 Injection pump Pump designation : PES4A90D410RS2294 EP type number : 0 410 894 011 Governor Governor design. : RQV300...1425AB780L Governer no. : 0 420 212 045 Customer-spec. information Customer : DAIMLER-BENZ : OM 314 Engine 1st version kW : 64.0 : 2850 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 000 Inlet press., bar: 1.50 Test nozzle holder assembly : 0 681 343 009 Openina (1997) pressure, bar : 172...175 Test lines : 1 680 750 014 Outside diameter x Wall thickness : 6.00X2.00X600 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_ BEGINNING OF DELIVERY Test pressure, bar: 25...27 : 2.15...2.25 : (2.10...2.30) Prestroke mm

Rack travel in mm : 9.00...12.00

: 1-3-4-2 Firing order Phasing : 0-90-180-270 Tolerance + - ° : 0.50 (0.75) BASIC SETTING 1st speed rpm: 1400 Rack travel in mm : 9.70...9.80 Del.quantity cm3/: 6.3...6.4 100 s: (6.1...6.6) Spread cm3 : 0.3100 s: (0.4) 2nd speed rpm : 300.0 Rack travel in mm : 7.5...7.7 Del.quantity cm3/: 0.9...1.5 100 s: (0.7...1.7) Spread cm3 : 0.2 100 s: (0.4) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 1460 : 8.40...8.60 travel mm 950 2nd speed rpm 5.20...5.50 travel mm 3rd speed rpm : 4.10...4.60 travel mm 4th speed 550 rpm 2.70...3.00 travel mm : : 300 5th speed rpm : 0.70...1.20 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1420 Speed Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version : 1400 Speed rpm : 63.5...64.5 Del.quantity : (61.5...66.5) : 3.00 1000 Spread cm3 1000 : (4.50)

RATED SPEED

D07

1st version Control lever

position degrees: 61...69

Testing:

1st rack travel in: 8.70

rpm : 1460...1470 Speed

2nd rack travel in: 4.00

rpm : 1540...1570 Speed

LOW IDLE 1 Control Lever

position degrees: 11...19

Testina:

: 200 Speed rpm Minimum rack trave: 8.20 Speed rpm : 300 Rack travel in mm : 7.50...7.70

CONSTANT REGULATION

rpm : 350...500 Speed

START CUT-OUT

1/min: 250 (240) Speed

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 8.70

Speed rpm : 1460...1470

INTERMEDIATE RATED SPEED

Control Lever

position degrees: 42...50 Rack travel in mm : 8.70 : 695...705 Speed rpm Rack travel in mm: 4.00

Speed : 830...860 rom

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 71.0...81.0

1000 s: (68.0...84.0)

Rack travel in mm : 13.70...14.30

Remarks:

Note remarks

: MB 3,8 g 5 : 07.02.89 Test sheet Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 400 844 055

Injection pump

Pump designation : PES4A90D410RS2294

: 0 410 894 011 EP type number

Governor

Governor design. : RQV300...1400AB836DL

: 0 420 212 050 Governer no.

Customer-spec. information

: DAIMLER-BENZ Customer

Engine : 0M314

1st version kW : 62.0 : 2800 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

: 1 680 750 014 Test lines

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.15...2.25 : (2.10...2.30)

Rack travel in mm : 9.00...12.00

009

Firing order : 1-3-4-2

Phasing : 0-90-180-270

Tolerance + - 0 : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1400

Rack travel in mm : 9.70...9.80

Del.quantity cm3/: 6.3...6.4

100 s: (6.1...6.6)

cm3 : 0.3Spread

100 s: (0.4)

2nd speed rpm: 300.0 Rack travel in mm: 7.5...7.7 Del.quantity cm3/: 0.9...1.5

100 s: (0.7...1.7)

cm3 : 0.2Spread 100 s: (0.4)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1460 1st speed

travel mm : 8.40...8.60

rpm : 950 2nd speed

: 5.20...5.50 travel mm

rpm : 775 3rd speed

: 4.10...4.60 travel mm : 550 4th speed rpm

: 2.70...3.00 : 300 travel mm

5th speed rpm

: 0.70...1.20 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1420 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1400 Speed

Speed Del.quantity 10<u>0</u>0 : 63.5...64.5 : (61.5...66.5) : 3.00

Spread cm3

1000 : (4.50)

RATED SPEED

1st version Control lever

position degrees: 61...69

Testing:

1st rack travel in: 8.70

Speed rpm: 1460...1470 2nd rack travel in: 4.00

rpm : 1540...1570 Speed

LOW IDLE 1 Control lever

position degrees: 11...19

Testing:

Speed rpm : 200 Minimum rack trave: 8.20

Speed rpm : 300 Rack travel in mm : 7.50...7.70

CONSTANT REGULATION

rpm : 350...500 Speed

START CUT-OUT

1/min: 220 (240) Speed

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 8.70

rpm : 1460...1470 Speed

INTERMEDIATE RATED SPEED

Control lever

position degrees: 113...121 Rack travel in mm : 8.70

Speed rpm : 1295...1305 Rack travel in mm : 4.00

: 1395...1425 Speed rpm

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 71.0...81.0

1000 s: (68.0...84.0)

Rack travel in mm : 13.70...14.30

Remarks:

D10

Note remarks

Test sheet : MB 4,0 a 12 Edition : 07.02.89

Replaces

Test oil : ISO-4113

: 0 400 844 094 Combination no.

Injection pump

Pump designation : PES4A90D410RS2666-2

EP type number : 0 410 894 033

Governor

: RQV300...1400AB1065-Governor design.

12L

Governer no. : 0 420 212 207

Customer-spec. information

Customer : DAIMLER-BENZ

: 0M364 Engine

1st version kW : 61.0 : 2800 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

: 1 680 750 015 Test lines

Outside diameter

x Wall thickness

: 6.00X1.50X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.25...2.35 Prestroke mm

: (2.20...2.40)

Rack travel in mm : 9.00...12.00 Firing order : 1-3-4-2

Phasina : 0-90-180-270

Tolerance + - 0 : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 1400

Rack travel in mm : 10.50...10.60

Del.quantity cm3/: 5.9...6.0

100 s: (5.7...6.2)

cm3 : 0.3Spread

100 s: (0.5)

rpm : 300.02nd speed Rack travel in mm: 8.6...8.8

Del.quantity cm3/: 0.8...1.2 100 s: (0.6...1.4) Spread cm3: 0.2

100 s: (0.4)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

: 0.80...1.30 travel mm

500 2nd speed rpm

: 2.30...2.80 : 750 travel mm

3rd speed rpm

: 4.10...4.30 rpm : 1500 travel mm

4th speed

: 8.50...8.60 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1400 Speed

: 59.0...60.0 Del.quantity

1000 : (57.0...62.0)

: 3.00 Spread cm3

1000 : (5.00)

RATED SPEED

1st version

Control lever

position degrees: 58...66

Testina:

1st rack travel in: 9.50

: 1440...1450 Speed rom 2nd rack travel in: 4.00 rpm : 1535...1565 Speed 4th rack travel in: 1700 Speed rpm : 0.00...1.00LOW IDLE 1 Control lever position degrees: 20...28 Testing: Speed rpm : 100 Minimum rack trave: 10.20 : 300 rom Rack travel in mm : 8.60...8.80 CONSTANT REGULATION Speed rpm : 540...680 TORQUE CONTROL Dimension a mm : 1.00 Torque control curve - 1st version st speed rpm : 1400 Rack travel in m: 10.50...10.60 1st speed rpm : 450 2nd speed Rack travel in m: 11.50...11.60 3rd speed rpm : 850 Rack travel in m: 10.90...11.10 START CUT-OUT 1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version rpm : 450 Speed Del.quantity cm3/: 45.0...47.0 1000 s: (42.5...49.5) rpm : 850 Speed Del.quantity cm3/: 47.5...50.5 1000 s: (45.0...53.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 9.50 Speed rpm : 1440...1450

#### Remarks:

Set shutoff stop to contact at 3.0...3.5 mm control-rod travel.

D12

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 78.0...88.0

Rack travel in mm : 17.00...17.40

1000 s: (75.0...91.0)

Note remarks

: MAN 9,2 f 1 : 10.02.89 Test sheet Edition Replaces : 28.8.87

: ISO-4113 Test oil

: 0 400 845 079 Combination no.

Injection pump

Pump designation: PES5A95D320LS2504

EP type number : 0 410 895 984

Governor

Governor design. : RQ250/1100AB1197R

: 0 420 201 639 Governer no.

Customer-spec. information

Customer : MAN

: D2565 MUL Engine

1st version kW : 141.0 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter

x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 1.50...1.60 Prestroke mm : (1.45...1.65)

Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288

Toterance + - 0 : 0.50 (0.75)

BASIC SETTING

rpm: 1100 1st speed

Rack travel in mm : 11.30...11.40

Del.quantity cm3/: 11.4...11.6

100 s: (11.2...11.8)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 250.02nd speed Rack travel in mm: 6.4...6.6 Del.quantity cm3/: 1.5...2.1 100 s: (1.2...2.3) Spread cm3: 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 600

Rack travel in mm : 15.60...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

: 114.0...116.0 Del.quantity 1000 : (112.0...118.0) cm3 : 3.00

Spread

1000 : (6.00)

RATED SPEED

1st version

Setting point:

rpm Rack travel in mm: 16.0

Testing:

1st rack travel in: 10.30

rpm : 1145...1160 Speed

2nd rack travel in: 4.00

Speed rpm : 1195...1225 4th rack travel in: 1300 Speed rpm : 0.00...1.00

D13

LOW IDLE 1

Setting point w/out bumper spring

rpm : 250 Speed Rack travel in mm: 6.5

Testina:

Speed : 100 rpm Minimum rack trave: 8.00 Speed rpm : 250 Rack travel in mm : 6.40...6.60

Rack travel in mm : 2.00 Speed rpm : 370...410

TORQUE CONTROL

Dimension a mm : 0.40

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 11.30...11.40

2nd speed rpm : 600

Rack travel in m: 11.70...11.80

3rd speed rpm : 940

Rack travel in m: 11.50...11.70 4th speed rpm : 1015 Rack travel in m: 11.40...11.60

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 500

Del.quantity cm3/: 113.0...116.0 1000 s: (110.5...118.5)

Speed rpm : 800 Del.quantity cm3/ : 115.5...118.5 1000 s: (113.0...121.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.30

rpm : 1145...1160 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 147.0...157.0

1000 s: (144.0...160.0)

Rack travel in mm : 15.70...16.30

LOW IDLE

Speed rpm : 250 Rack travel in mm : 6.40...6.60 Del.quantity cm3/ : 15.0...21.0 1000 s: (12.5...23.5)

Spread cm3 : 3.001000 s: (5.00)

Remarks:

: MAN-NR. 2-7500

Set idle stop at 250 min -1 to a

control-rod travel of 6.5 mm

D14

Note remarks

Test sheet : MAN 7,0 c 1
Edition : 03.03.89
Replaces : 5.9.88
Test oil : ISO-4113

Combination no. : 0 400 846 264

Injection pump

Pump designation : PES6A85D32ORS2337 EP type number : 0 410 886 921

Governor

Governor design. : RQ200/1250AB801DR Governor no. : 0 420 203 089

Customer-spec. information Customer : MAN

Engine : D0846HM42U

1st version kW : 118.0 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.50...1.60 : (1.45...1.65)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance  $+ - \circ : 0.50 (0.75)$ 

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm: 1250

Rack travel in mm : 10.70...10.80

Del.quantity cm3/: 7.0...7.1

100 s: (6.8...7.3)

Spread cm3: 0.3

100 s: (0.4)

2nd speed rpm : 200.0 Rack travel in mm : 8.4...8.6 Del.quantity cm3/ : 1.8...2.4 100 s: (1.6...2.6)

Spread cm3 : -

100 s: (0.4)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

Speed rpm: 550

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 1250

Del.quantity : 70.0...71.0 1000 : (68.0...73.0)

Spread cm3 : 3.00

1000 : (4.50)

RATED SPEED

1st version

Setting point:

Speed rpm : 550

Rack travel in mm : 20.0

Testing:

1st rack travel in: 9.75

Speed rpm : 1295...1310

2nd rack travel in: 4.00

Speed rpm : 1325...1355

015

LOW IDLE 1 Setting point w/out bumper spring Speed rpm : 200 Rack travel in mm: 8.5 Testina: Speed rpm : 100 Minimum rack trave: 9.90 rpm : 200 Speed Rack travel in mm: 8.40...8.60 Rack travel in mm: 2.00 Speed rpm: 340...380 TORQUE CONTROL Dimension a mm : 0.30 Torque control curve - 1st version 1st speed rpm : 1250 Rack travel in m: 10.70...10.80 2nd speed rpm : 500
Rack travel in m: 11.40...11.50
4th speed rpm : 1000
Rack travel in m: 11.20...11.40
5th speed rpm : 1125
Rack travel in m: 10.90...11.10 FUEL DELIVERY CHARACTERISTICS 1st version : 500 Speed rpm Del.quantity cm3/: 0.0...69.5 1000 s: (0.0...72.0) Speed rpm: 800 Del.quantity cm3/: 69.0...72.0 1000 s: (66.5...74.5) RACK STOP ADJUSTMENT Speed : 200 rpm **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 9.75 rpm : 1295...1310 Speed STARTING FUEL DELIVERY : 100 Speed rpm Del.quantity cm3/: 123.0...133.0 1000 s: (120.0...136.0)

Rack travel in mm : 18.10...18.50

: MAN-NR.1-7504

**APPLICATION Omnibus** 

Remarks:

Note remarks

Test sheet : KHD 9,6 k 6 Edition : 11.11.88

Replaces

Test oil : ISO-4113

Combination no. : 0 400 846 432

Injection pump

Pump designation : PES6A95D410RS2416 EP type number : 0 410 896 961

Governor

Governor design. : RQ750AB1240L Governer no. : 0 420 200 110

Customer-spec. information

Customer : KHD

Engine : F6L413FR

1st version kW : 122.0 : 1500 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

pressure, bar : 172...175

: 1 680 750 014 Test Lines

Outside diameter

x Wall thickness

x Length mm : 6.00X2.00X-600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00

: (1.85...2.05)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 10.40...10.50

Del.quantity cm3/: 10.1...10.3

100 s: (9.9...10.5)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 250.0 Rack travel in mm : 5.3...5.5 Del.quantity cm3/: 1.0...1.6

100 s: (0.7...1.8)

Spread cm3 : 0.3100 s: (0.5)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed

: 101.0...103.0 Del.quantity 1000

: (99.0...105.0) : 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version

Testing:

1st rack travel in: 9.40 rpm : 750...755 Speed 2nd rack travel in: 3.70 Speed rpm: 780...785

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

1st speed rpm : 700

Rack travel in m: 10.40...10.50 ad speed rpm : 500

2nd speed

Rack travel in m: 10.40...10.60

START CUT-OUT

Speed 1/min: 640 (660)

D17

## **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 9.40 Speed rpm : 750...755 Speed

STARTING FUEL DELIVERY

Remarks:

**APPLICATION** 

Generator set

Note remarks

Test sheet

: KHD 9,6 p 1

Edition

: 09.03.87

Replaces

Test oil

: ISO-4113

Combination no.

: 0 400 846 433

Injection pump

Pump designation

: PES6A95D410RS2416

EP type number

: 0 410 896 961

Governor

Governor design. : RQ900AB1054L

Governer no.

: 0 420 200 064

Customer-spec. information Customer

: KHD

: F6L413FR

Engine

1st version kW

: 106.0

Rated speed

: 1800

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.00

Test nozzle holder

assembly

: 0 681 343 009

Opening

pressure, bar

: 172...175

Test lines

: 1 680 750 014

Outside diameter

x Wall thickness

x Length mm

: 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 1.90...2.00

: (1.85...2.05)

Rack travel in mm : 9.00...12.00

019

Firing order

: 1-5-3-6-2-4

Phasing

: 0-60-120-180-240-300

Tolerance + - °

: 0.50 (0.75)

BASIC SETTING

1st speed

rpm: 850

Rack travel in mm : 9.00...9.10

Del.quantity cm3/: 8.5...8.7

100 s: (8.3...8.9)

Spread

cm3 : 0.3

100 s: (0.6)

rpm : 250.0 2nd speed

Rack travel in mm : 5.6...5.8

Del.quantity cm3/: 0.9...1.5

100 s: (0.6...1.7)

cm3 : 0.3

100 s: (0.5)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Del.quantity

Speed

Spread

rpm : 850

: 85.5...87.5 : (83.5...89.5) 1000

Spread

: 3.00

cm3 1000 : (6.00)

RATED SPEED

1st version

Testing:

1st rack travel in: 8.60

Speed rpm : 900...905 2nd rack travel in: 3.50 Speed rpm : 930...940

START CUT-OUT

Speed

1/min: 810 (830)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 8.60

Speed

rpm : 900...905

# STARTING FUEL DELIVERY

:

Remarks:

APPLICATION

Generator set

Note remarks

: DAF 6,2 p 2 Test sheet Edition : 07.02.89 : 30.5.88 Replaces

Test oil : ISO-4113

Combination no. : 0 400 846 538

Injection pump

Pump designation : PES6A95D32ORS2693 EP type number : 0 410 896 914

Governor

Governor design. : RQ300/1300AB1204R

Governer no. : 0 420 201 640

Customer-spec. information

Customer : DAF

Engine : DNT 620

: 130.0 1st version kW : 2600 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10

: (1.95...2.15)

Rack travel in mm : 7.50...10.50

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50 & maximum rack tra: 21.00

Difference ° CS : 2.50...3.50

BASIC SETTING

rpm: 850 1st speed

Rack travel in mm : 0.90...1.00

Del.guantity cm3/: 7.7...7.8

100 s: (7.5...8.0)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 300.02nd speed

Rack travel in mm : 6.5...6.7 Del.quantity cm3/: 0.7...1.1

100 s: (0.4...1.3)

Spread cm3 : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position Degree: -2

rpm : 850 Speed

Rack travel in mm : 16.80...18.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 700

Del.quantity 1000 : 77.5...78.5 : (75.5...80.5) : 3.50

Spread cm3

1000 : (6.00)

RATED SPEED

1st version

Setting point:

Speed rpm Rack travel in mm : 17.6

D21

Testing: 1st rack travel in: 9.70 Speed rpm : 1350...1365 2nd rack travel in: 4.00 rpm : 1420...1450 Speed 4th rack travel in: 1550 rom : 0.00...1.00Speed LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Rack travel in mm : 6.6 Testing: Speed rpm : 100 Minimum rack trave: 7.60 Speed rpm : 300
Rack travel in mm : 6.50...6.70
Rack travel in mm : 2.00 rpm : 545...585 Speed TORQUE CONTROL Dimension a mm : 0.55 Torque control curve - 1st version rpm : 1290 1st speed Rack travel in m: 9.60...9.70 rpm : 850 2nd speed Rack travel in m: 11.20...11.40 d speed rpm : 935 3rd speed Rack travel in m: 10.80...11.10 4th speed rpm : 1080 Rack travel in m: 10.60...11.00 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rpm hPa : 700 Pressure Rack travel mm : 11.50...11.60 Measurement 1/min: 600 Speed 1st pressure hPa : -Rack travel in m: 11.20...11.40 2nd pressure hPa : 250 Rack travel in m: 11.40...11.50 START CUT-OUT 1/min : 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version

D22

Aneroid pressure h: 700 Speed rpm : 1290 Del.quantity cm3/ : 73.0...75.0 1000 s: (70.5...77.5) Aneroid pressure h: -Speed rpm : 600 Del.quantity cm3/ : 65.0...67.0 1000 s: (63.0...69.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 9.70 rpm : 1350...1365 Speed STARTING FUEL DELIVERY : 100 Speed rpm Del.quantity cm3/: 130.0...145.0 1000 s: (127.0...148.0) Rack travel in mm : 19.50...21.00 LOW IDLE Speed rpm : 300
Rack travel in mm : 6.50...6.70
Del.quantity cm3/ : 7.0...11.0
1000 s: (4.5...13.5)
Spread cm3 : 3.50 1000 s: (5.50)

Remarks:

When adjusting the governor, observe service information on microcard W-400/008.

Note remarks

: MWM 3,1 b 2 Test sheet Edition : 10.02.89 : 12.1.89 Replaces Test oil : ISO-4113

Combination no. : 0 400 863 008

Injection pump

Pump designation : PES3A90D320/3RS2658

: 0 410 893 004 EP type number

Governor

: RSV325...1500A2C505-Governor design.

3R

: 0 420 233 229 Governer no.

Customer-spec. information Customer : MWM

: D226B-3 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

assembly : D 681 343 009

**Opening** 

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.95...3.05 Prestroke mm

: (2.90...3.10)

Rack travel in mm: 9.00...12.00 Firing order: 1-2-3 Firing order

Phasing : 0-120-240

Tolerance + - 0 : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00 & maximum rack tra: 21.00 Difference ° CS : 3.50...4.50

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 11.20...11.30

Del.guantity cm3/: 8.9...9.0

100 s: (8.7...9.2)

cm3 : 0.3Spread

100 s: (0.5)

rpm : 325.0 2nd speed Rack travel in mm: 9.7...9.9

Del.quantity cm3/: 4.6...5.2

100 s: (4.4...5.4) cm3 : 0.2 Spread

100 s: (0.4)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

Speed rpm: 800 Rack travel in mm: 0.30...0.70

Governor spring pre-tension Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1100 Speed

: 89.5...90.5 : (87.5...92.5) : 3.00 Del.quantity 1000

Spread cm3

: (5.00) 1000

RATED SPEED

1st version

Control Lever

position degrees: 39...47

Testing:

1st rack travel in: 10.20 Speed rpm : 1140...1150

2nd rack travel in: 4.00 rpm : 1180...1210 Speed 3rd rack travel in: 4.00 rpm : 1210...1240 Speed 4th rack travel in: 1375 rpm : 0.30...1.40 Speed

LOW IDLE 1 Control lever

position degrees: 13...21

Setting point w/out bumper spring

rpm : 325 Rack travel in mm: 9.3

Speed rpm : 325
Rack travel in mm : 9.70...9.90
Rack travel in mm : 2.00

rpm : 480...540 Speed

TORQUE CONTROL

Torque control curve - 1st version 1st speed rpm : 1100 Rack travel in m: 11.20...11.30

rpm : 500 2nd speed

Rack travel in m: 11.20...11.40

#### **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 10.20

rpm : 1140...1150 Speed

STARTING FUEL DELIVERY

Remarks:

Note remarks

: KHD 1 g 31 : 22.05.87 Test sheet Edition Replaces : 9.3.87

Test oil : ISO-4113

: 0 400 864 069 Combination no.

Injection pump

Pump designation : PES4A85D410/3RS2732

EP type number : 0 410 884 947

Governor

Governor design. : RSV325...1175A8C2163

-3L

: 0 420 232 474 Governer no.

Customer-spec. information Customer : KHD

: F4I 913 Engine

: 55.0 1st version kW : 2350 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.00

Test nozzle holder

assembly : 0 681 343 009

Openina

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm

: 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.50...2.60 Prestroke mm

: (2.45...2.65)

Rack travel in mm : 9.00...12.00

Firing order : 1-3-4-2

Phasina : 0-90-180-270

Tolerance + - 0 : 0.50 (0.75)

BASIC SETTING

1st speed rom: 1175

Rack travel in mm : 9.80...9.90

Del.quantity cm3/: 6.7...6.8

100 s: (6.5...7.0)

Spread cm3 : 0.3

100 s: (0.4)

rpm : 325.0 2nd speed Rack travel in mm: 6.3...6.5 Del.quantity cm3/: 1.0...1.6

100 s: (0.8...1.8)

cm3 : 0.2 Spread 100 s: (0.4)

GUIDE SLEEVE POSITION Control-lever position Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 4.25

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1175

: 67.0...68.0 Del.quantity 1000 : (65.0...70.0)

: 3.00 Spread cm3 1000 : (4.50)

RATED SPEED

1st version Control lever

position degrees: 53...61

Testina:

1st rack travel in: 8.80

Speed rpm : 1215...1225

2nd rack travel in: 4.00

: 1235...1265 Speed rpm

3rd rack travel in: 4.00

rpm : 1255...1285 Speed 4th fack travel in: 1420 Speed rpm : 0.30...1.40

LOW IDLE 1 Control lever

position degrees: 15...23 Setting point w/out bumper spring

Speed rpm : 325 Rack travel in mm : 5.6

Testing:

Speed rpm : 100 Minimum rack trave: 19.50 rpm : 325

Rack travel in mm : 5.90...6.10 Rack travel in mm : 2.00

: 460...520 Speed rpm

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1175
Rack travel in m: 9.80...9.90
2nd speed rpm : 500
Rack travel in m: 10.30...10.40

3rd speed rpm : 800

Rack travel in m: 10.20...10.30

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 800

Del.quantity cm3/: 58.0...60.0 1000 s: (55.5...62.5)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 8.80

rpm : 1215...1225 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 120.0...130.0 1000 s: (117.0...133.0)

Rack travel in mm : 17.10...17.30

Remarks:

: TKS 2.80

**APPLICATION** 

Tractor (tractor engines)

026

Note remarks

Test sheet : FOR 5,9 f 5 Edition : 27.03.87

Replaces

Test oil : ISO-4113

Combination no. : 0 400 866 109

Injection pump

Pump designation : PES6A90D210RS2629 EP type number : 0 410 896 075

Governor

: RSV350...1300A0C2139 Governor design.

: 0 420 232 374 Governer no.

Customer-spec. information Customer : FORD/GB

: 380 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

Test lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80 : (2.65...2.85)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm: 1250 1st speed

Rack travel in mm : 12.90...13.00

Del.quantity cm3/ : 7.2...7.3

100 s: (7.0...7.5)

cm3 : 0.3Spread

100 s: (0.4)

rpm : 350.02nd speed Rack travel in mm: 6.4...6.5 Del.quantity cm3/ : 0.9...1.3

100 s: (0.7...1.5)

cm3 : 0.2Spread 100 s: (0.4)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rbm : 800

Rack travel in mm : 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 72.0...73.0 1000 : (70.0...75.0)

: 3.00 Spread cm3

1000 : (4.50)

RATED SPEED

1st version

Control lever

position degrees: 64...72

Testing:

1st rack travel in: 11.90

Speed rpm : 1365...1375

2nd rack travel in: 4.00

Speed rpm : 1480...1510

3rd rack travel in: 4.00

Speed rpm: 1505...1535 4th rack travel in: 1670

Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever

position degrees: 30...38
Setting point w/out bumper spring
Speed rpm : 350

Rack travel in mm: 6.0

Testing:

Speed rpm : 100 Minimum rack trave: 19.00 rpm : 350 Speed

Rack travel in mm: 6.40...6.60
Rack travel in mm: 2.00
Speed rpm: 515...575
Speed rpm: 650

Maximum rack trave: 1.00

## **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 11.90

Speed rpm : 1365...1375

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 76.0...90.0 1000 s: (73.0...93.0)

Rack travel in mm: 19.00...21.00

Remarks:

At start of delivery, locating pin must latch into slit in pointer.

Note remarks

Test sheet : KHD 1 g 24 : 07.02.89° : 9.3.87 Edition Replaces

Test oil : ISO-4113

Combination no. : 0 400 866 118

Injection pump

Pump designation : PES6A85D410/3RS2611

EP type number : 0 410 886 902

Governor

Governor design. : RSV325...1150A8C604L Governer no. : 0 420 232 319

Customer-spec. information Customer : KHD

: F6L913 Engine

1st version kW : 78.0 : 2300 Rated speed

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.50...2.60 : (2.45...2.65) Prestroke mm

Rack travel in mm : 9.00...12.00

TEST BENCH REQUIREMENTS

E01

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - 0 : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 1150

Rack travel in mm : 10.20...10.30

Del.quantity cm3/: 6.0...6.1

100 s: (5.8...6.3)

cm3 : 0.3Spread

100 s: (0.5)

rpm : 325.02nd speed Rack travel in mm: 8.4...8.6 Del.quantity cm3/: 1.0...1.6

100 s: (0.8...1.8) cm3 : 0.2 Spread

100 s: (0.4)

GUIDE SLEEVE POSITION Control-lever position Degree: -3

rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1150 Speed

Del.quantity : 60.5...61.5 1000 : (58.5...63.5)

: 3.00 Spread cm3

1000 : (5.00)

RATED SPEED

1st version

Control lever

position degrees: 49...57

Testing:

1st rack travel in: 9.20

rpm : 1190...1200 Speed

2nd rack travel in: 4.00

Speed rpm : 1215...1245

3rd rack travel in: 4.00

: 1240...1270 Speed rpm

4th rack travel in: 1400 rpm : 0.30...1.40 Speed LOW IDLE 1 Control lever position degrees: 13...21 Setting point w/out bumper spring rpm : 325 Rack travel in mm: 8.0 Testing: Speed rpm : 100 Minimum rack trave: 19.50 rpm : 325 Rack travel in mm : 8.40...8.60 Rack travel in mm : 2.00 : 440...500 Speed rpm TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1150 Rack travel in m: 10.20...10.30 2nd speed rpm : 500 Rack travel in m: 10.20...10.40 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 500 Del.quantity cm3/ : 39.5...41.5 1000 s: (37.0...44.0) Speed rpm : 800 Del.quantity cm3/: 48.0...50.0 1000 s: (45.5...52.5) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 9.20 rpm : 1190...1200 Speed STARTING FUEL DELIVERY Remarks:

Note remarks

Test sheet : CUM 8,3 k 2 Edition : 15.06.88

Replaces

Test oil : ISO-4113

: 0 400 866 124 Combination no.

Injection pump

Pump designation : PES6A1000320/3RS2691

EP type number : 9 410 230 025

Governor

Governor design. : RSV400...1250A0C2216

-2R

Governer no. : 0 420 233 217

Customer-spec. information Customer : C.D.C.

: 6 CT 830 Engine

: 160.0 1st version kW : 2500 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 017 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

: 1 680 750 014 Test lines

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

: (2.75...2.95) Rack travel in mm : 10.50

: 1-5-3-6-2-4 Firing order

: 2.80...2.90

Phasing

Prestroke mm

: 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no.

BASIC SETTING

1st speed rpm: 1250

Rack travel in mm : 12.00...12.10

Del.guantity cm3/: 12.1...12.3

100 s: (11.9...12.5)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 400.0 2nd speed

Rack travel in mm : 5.7...5.9 Del.guantity cm3/: 1.6...2.0

100 s: (1.3...2.2)

cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3 rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm

: 1250 : 121.0...123.0 Del.quantity : (119.0...125.0) 1000

: 3.50 cm3 Spread

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 58...66

Testing:

**E03** 

1st rack travel in: 11.00 Speed rpm : 1290...1300 2nd rack travel in: 4.00 rpm : 1395...1425 Speed 4th rack travel in: 1500 rpm : 0.30...1.40Speed LOW IDLE 1 Control lever position degrees: 33...41 Setting point w/out bumper spring rpm : 400 Rack travel in mm : 5.3 Testing: : 100 Speed rpm Minimum rack trave: 19.00 rpm : 400 Rack travel in mm : 5.20...5.40 Rack travel in mm : 2.00 rpm : 510...570 Speed TORQUE CONTROL Torque control curve - 1st version rpm : 1250 1st speed Rack travel in m: 12.00...12.10 2nd speed rpm : 750 Rack travel in m: 12.40...12.60 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 750 Del.quantity cm3/: 122.0...126.0 1000 s: (120.0...128.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.00 : 1290...1300 Speed rom INTERMEDIATE RATED SPEED Rack travel in mm: 4.00 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 135.0...155.0 1000 s: (130.0...160.0) Rack travel in mm: 20.00...21.00

rom : 400

LOW IDLE

Speed

E04

Rack travel in mm : 5.70...5.90 Del.quantity cm3/ : 16.0...20.0 1000 s: (13.5...22.5) Spread cm3 : 3.50 1000 s: (5.50) Remarks: Adjust stop Lever to 0.5...1.0 mm before stop. Start-of-delivery mark 11° cam angle after start of delivery cyl. 1

Note remarks

Edition

Replaces

Test oil

: 0 400 866 128 Combination no.

Injection pump

Pump designation : PES6A100D320/3RS2763

EP type number : 0 410 806 006

Governor

: RSV410...950A0C2190-

26R

Governer no.

Customer-spec. information Customer : C.D.C.

: 6 CT Engine

: 138.0 1st version kW : 1900 Rated speed

Overflow valve

: 1 417 413 047

Test nozzle holder

Opening 1

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

x Length mm

Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test sheet : CUM 8,3 L

: 20.12.88

: ISO-4113

Governor design.

: 0 420 233 224

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Inlet press., bar: 1.50

: 1 688 901 017 assembly

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00X2.00X600

(A) Injection pump setting values

Test pressure, bar: 27...29

E05

: 2.80...2.90 : (2.75...3.00) Prestroke mm

Rack travel in mm : 10.50

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 950 1st speed

Rack travel in mm : 9.60...9.70

Del.quantity cm3/: 8.4...8.6

100 s: (8.2...8.8)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 410.0 2nd speed Rack travel in mm: 5.0...5.2 Del.quantity cm3/ : 1.6...2.0 100 s: (1.3...2.2)

cm3 : 0.3 Spread 100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 950 Speed

: 84.5...86.5 Del.quantity 1000 : (82.5...88.5)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version

Control lever position degrees: 40...48

Testing:

1st rack travel in: 8.60 rpm : 1010...1020 Speed

2nd rack travel in: 4.00

rpm : 1050...1080 Speed

4th rack travel in: 1150

Speed rpm : 0.30...1.40

LOW IDLE 1 Control Lever

position degrees: 24...32

Setting point w/out bumper spring

: 410 rpm Rack travel in mm: 4.6

Testina:

Speed : 100 rpm Minimum rack trave: 19.00

: 410 Speed rpm

Rack travel in mm : 5.00...5.20 Rack travel in mm : 2.00

rpm : 455...515

TORQUE CONTROL

Torque control curve - 1st version

rpm : 950 1st speed

Rack travel in m: 9.60...9.70

2nd speed rpm : 650

Rack travel in m: 10.70...10.90

FUEL DELIVERY CHARACTERISTICS

1st version

Speed : 650 rpm

Del.quantity cm3/: 99.0...103.0 1000 s: (97.0...105.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 8.60

: 1010...1020 Speed rpm

STARTING FUEL DELIVERY

LOW IDLE

rpm : 410 Speed

Rack travel in mm : 5.00...5.20 Del.quantity cm3/ : 16.0...20.0 1000 s: (13.5...22.5)

E06

cm3 : 3.50 1000 s: (5.50) Spread

Remarks:

Adjustment without torque-control spring retainer with 0,5 mm less control-rod travel. Increase in full-load delivery with torque-control spring retainer.

Adjust stop lever to 0.5...1.0 mm before stop.

Start-of-delivery mark at 10° cam rotation angle after start of delivery, cylinder 1

Note remarks

Test sheet : CUM 8,3 l 1 Edition : 20.12.88

Replaces :

Test oil : ISO-4113

Combination no. : 0 400 866 129

Injection pump

Pump designation: PES6A100D320/3RS2763

EP type number : 0 410 806 006

Governor

Governor design. : RSV400...1050A0c2190

-27R

Governer no. : 0 420 233 225

Customer—spec. information Customer : C.D.C.

Engine : 6CT 8.3

1st version kW : 111.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 017

**Opening** 

pressure, bar : 207...210

Orifice plate

diameter mm : 0.6

Test lines : 1 680 750 014

Outside diameter

x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

E07

Prestroke mm : 2.80...2.90 : (2.75...2.95)

Rack travel in mm : 10.50

Firing order : 1-5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance  $+ - \circ : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 10.20...10.30

Del.quantity cm3/: 8.7...8.9

100 s: (8.5...9.1)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 400.0 Rack travel in mm : 5.3...5.5 Del.quantity cm3/ : 1.1...1.5

100 s: (0.9...1.8)

Spread cm3 : 0.3 100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

Speed rpm : 800 Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 1100

Del.quantity : 87.0...89.0 1000 : (85.0...91.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 46...54

Testing:

1st rack travel in: 9.20 rpm : 1145...1155 Speed 2nd rack travel in: 4.00 : 1205...1235 Speed rpm 3rd rack travel in: 4.00 Speed rpm : 1210...1240 4th rack travel in: 1300 Speed rpm : 0.30...1.40 LOW IDLE 1 Control lever position degrees: 25...33 Setting point w/out bumper spring rpm : 400

Rack travel in mm: 4.9 Testing:

Speed rpm : 100 Minimum rack trave: 19.00 rpm : 400 Speed Rack travel in mm : 5.30...5.50 Rack travel in mm : 2.00

: 470...530 Speed rpm

TORQUE CONTROL Torque control curve - 1st version rpm : 1100 1st speed Rack travel in m: 10.20...10.30

2nd speed rpm : 750 Rack travel in m: 11.30...11.50

FUEL DELIVERY CHARACTERISTICS

1st version Speed

rpm : 750 Del.quantity cm3/: 99.0...103.0 1000 s: (97.0...105.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 9.20 rpm : 1145...1155 Speed

STARTING FUEL DELIVERY

Speed : 100 rpm

Del.quantity cm3/: 150.0...170.0 1000 s: (145.0...175.0) Rack travel in mm: 19.00...21.00

LOW IDLE

Speed : 400 rpm

Rack travel in mm : 5.30...5.50

F08

Del.quantity cm3/: 11.5...15.5

1000 s: (9.0...18.0)

cm3 : 3.50 Spread 1000 s: (5.50)

Remarks:

Adjustment without torque-control spring retainer with 0,5 mm less control-rod travel. Increase in full-load delivery with torque-control spring retainer.

Adjust stop lever to 0.5...1.0 mm before stop.

Start-of-delivery mark 11° cam angle after start of delivery cyl. 1

Note remarks

: CUM 8,3 m Test sheet : 20.12.88 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 400 866 131

Injection pump

Pump designation : PES6A100D320/3RS2691

: 9 410 230 025 EP type number

Governor

Governor design. : RSV425...900A4C2213-

2R

: 0 420 233 230 Governer no.

: 3914869 Cust. part no.

Customer-spec. information Customer : C.D.C.

: 6 CT 8.3 Engine

1st version kW : 154.0 : 1800 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 017 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

: 2.80...2.90 : (2.75...2.95) Prestroke mm

Rack travel in mm : 10.50

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no.

BASIC SETTING

1st speed rpm: 830

Rack travel in mm : 13.40...13.50

Del.quantity cm3/: 13.5...13.7

100 s: (13.3...13.9)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 425.0 2nd speed Rack travel in mm : 5.5...5.7 Del.quantity cm3/ : 1.2...1.6

100 s: (0.9...1.8)

cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position Degree: -3

rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 830 Speed

Del.quantity : 135.0...137.0 1000 : (133.0...139.0)

: 3.50 cm3

Spread

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 44...48

Testing: 1st rack travel in: 12.40 rpm : 925...935 Speed 2nd rack travel in: 4.00 rpm : 960...990 Speed 3rd rack travel in: 4.00 4th rack travel in: 1030 rpm : 0.30...1.40 Speed LOW IDLE 1 Control Lever position degrees: 20...28 Setting point w/out bumper spring rpm : 425 Rack travel in mm: 5.0 Testing: : 100 Speed rpm Minimum rack trave: 19.00 : 425 rpm Rack travel in mm : 5.40...5.60 Rack travel in mm : 2.00 : 435...495 Speed rpm BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 12.40 rpm : 925...935 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 135.0...155.0 1000 s: (130.0...160.0) Rack travel in mm: 19.00...21.00 LOW IDLE Speed rpm Rack travel in mm : 5.50...5.70 Del.quantity cm3/: 12.0...16.0 1000 s: (9.5...18.5) cm3 : 3.50Spread 1000 s: (5.50) Remarks: Adjust stop lever to 0.5...1.0 mm before stop. Start-of-delivery mark at 10° cam rotation angle after start of delivery, cylinder 1

E10

Note remarks

: CUM 8,3 m 1 Test sheet Edition : 20.12.88

Replaces

: ISO-4113 Test oil

Combination no. : 0 400 866 138

Injection pump

Pump designation : PES6A100D320/3RS2691

: 9 410 230 025 EP type number

Governor

: RSV425...750A4C2213-Governor design.

3R

: 0 420 233 235 Governer no.

Customer—spec. information Customer : C.D.C.

: 6CT- 8.3 L Engine

: 135.0 1st version kW : 1500 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 017 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0.6

Test lines : 1 680 750 014

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

: 2.80...2.90 : (2.75...2.95) Prestroke mm

Rack travel in mm : 10.50

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 750 1st speed

Rack travel in mm : 14.00...14.10

Del.guantity cm3/: 14.2...14.4

100 s: (14.0...14.6)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 425.0 2nd speed

Rack travel in mm: 6.0...6.2 Del.quantity cm3/: 1.8...2.2

100 s: (1.5...2.4)

cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

Del.quantity

: 142.5...144.5 : (140.5...146.5) 1000

3.50 Spread cm3 1000

: (6.00)

RATED SPEED

1st version

Control lever

position degrees: 37...45

Testing:

1st rack travel in: 13.00 Speed rpm : 795...805 2nd rack travel in: 4.00 Speed rpm: 825...855 3rd rack travel in: 4.00 rpm : 830...860 Speed LOW IDLE 1 Control lever position degrees: 19...27 Setting point w/out bumper spring rpm : 425 Rack travel in mm: 5.6 Testing: Speed rpm : 100 Minimum rack trave: 19.00 : 425 Speed rpm Rack travel in mm : 6.00...6.20 Rack travel in mm : 2.00 : 440...500 Speed rpm **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 13.00 rpm : 795...805 Speed STARTING FUEL DELIVERY Speed : 100 rpm Del.quantity cm3/: 135.0...155.0 1000 s: (130.0...160.0) Rack travel in mm : 19.00...21.00 LOW IDLE rpm : 425 Speed Rack travel in mm : 6.00...6.20 Del.quantity cm3/: 18.0...22.0 1000 s: (15.5...24.5) cm3 : 3.50 Spread 1000 s: (5.50) Remarks: Start-of-delivery mark at 10° cam rotation angle after start of delivery, cylinder 1 Adjust stop lever to 0.5...1.0 mm before stop. **APPLICATION** 

Generator

E12

Note remarks

: CUM 8,3 L 2 : 20.12.88 Test sheet Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 400 866 139

Injection pump

Pump designation : PES6A100D320/3RS2763

EP type number : 0 410 806 006

Governor

Governor design. : RSV400...1250A0c2190

-32R

Governer no. : 0 420 233 236

Customer-spec. information Customer : CDC

: 6 CT 8.3 ltr Engine

1st version kW : 114.0 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 457 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 017 assembly

Opening.

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90 : (2.75...2.95) Rack travel in mm : 10.50

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1250

Rack travel in mm : 9.20...9.30

Del.quantity cm3/: 8.4...8.6

100 s: (8.2...8.8)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 400.02nd speed Rack travel in mm: 5.1...5.3 Del.quantity cm3/: 1.6...2.0

100 s: (1.3...2.2)

cm3 : 0.3Spread 100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

: 1250 Speed man

: 84.0...86.0 Del.quantity : (82.0...88.0) 1000

: 3.50 cm3

Spread 1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 53...61

Testing:

E13

1st rack travel in: 8.20 rpm : 1310...1320 Speed 2nd rack travel in: 4.00 rpm : 1345...1375 Speed 3rd rack travel in: 4.00

Speed rpm: 1350...1380 4th rack travel in: 1450

rpm : 0.30...1.40 Speed

LOW IDLE 1 Control lever

position degrees: 28...36

Setting point w/out bumper spring

rpm : 400 Rack travel in mm: 4.7

Testing:

Speed rpm : 100 Minimum rack trave: 19.00

Speed rpm : 400
Rack travel in mm : 5.10...5.30
Rack travel in mm : 2.00

: 480...540 Speed rpm

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1250

Rack travel in m: 9.20...9.30

2nd speed rpm : 800

Rack travel in m: 9.60...9.80

FUEL DELIVERY CHARACTERISTICS

1st version

rpm : 800 Speed

Del.quantity cm3/: 80.5...84.5 1000 s: (78.5...86.5)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 8.20

: 1310...1320 Speed man.

STARTING FUEL DELIVERY

Speed : 100 rpm

Del.quantity cm3/: 145.0...165.0 1000 s: (140.0...170.0) Rack travel in mm: 19.00...21.00

LOW IDLE

rpm : 400

Rack travel in mm : 5.10...5.30

E14

Del.quantity cm3/: 16.0...20.0 1000 s: (13.5...22.5) Spread cm3 : 3.50

1000 s: (5.50)

Remarks:

Adjustment without torque-control spring retainer with 0,5 mm less control-rod travel. Increase in full-load delivery with torque-control spring retainer.

Adjust stop lever to 0.5...1.0 mm before stop.

Start-of-delivery mark 11° cam angle after start of delivery cyl. 1

Note remarks

: CUM 5,9 V Edition : 10.02.89

Replaces

Test oil

: 0 400 866 143 Combination no.

Injection pump

Pump designation : PES6A95D12ORS2773 EP type number : 0 410 896 904

Governor

: RSV350...1250A2C2237 Governor design.

Governer no.

Customer-spec. information : CUMMINS Customer

Engine : 6BT

: 118.0 1st version kW : 2500 Rated speed

TEST BENCH REQUIREMENTS

: 38...42

Overflow valve

Inlet press., bar: 1.50

Test nozzle holder

Opening |

: 207...210 pressure, bar

Orifice plate

Outside diameter

x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test sheet

: ISO-4113

: 0 420 233 240

Test oil

inlet temp. °C

: 1 417 413 000

: 1 688 901 017 assembly

diameter mm : 0,6

: 1 680 750 008 Test lines

× Wall thickness

: 6.00X2.00X600

Test pressure, bar: 25...27

Prestroke mm : 2.10...2.20 : (2.05...2.25) Rack travel in mm : 9.00...12.00 Firing order : 1-5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

BASIC SETTING

rpm: 1250 1st speed

Rack travel in mm : 9.40...9.50

Del.guantity cm3/: 8.8...9.0

100 s: (8.6...9.3)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 350.02nd speed Rack travel in mm : 5.4...5.6 Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.4)

cm3 : 0.3Spread 100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 3.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1250 Speed

: 88.5...90.5 Del.quantity 1000 : (86.0...93.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 39...47

Testina:

1st rack travel in: 8.40

rpm : 1290...1300 Speed

2nd rack travel in: 4.00 rpm : 1355...1385 Speed 3rd rack travel in: 4.00 Speed rpm : 1365...1395 4th rack travel in: 1530 rpm : 0.30...1.40Speed LOW IDLE 1 Control lever position degrees: 20...28 Setting point w/out bumper spring rom Rack travel in mm: 5.0 Testing: Speed rpm : 100 Minimum rack trave: 19.50 Speed rpm : 350
Rack travel in mm : 5.40...5.60
Rack travel in mm : 2.00 Speed rpm : 465...525 TORQUE CONTROL Torque control curve - 1st version rpm : 1250 1st speed Rack travel in m: 9.40...9.50 2nd speed rpm : 500 Rack travel in m: 9.40...9.60 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 500 Del.quantity cm3/ : 77.0...80.0 1000 s: (75.0...82.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 8.40 rpm : 1290...1300 Speed STARTING FUEL DELIVERY Speed : 100 rpm Del.quantity cm3/: 110.0...120.0 1000 s: (107.0...123.0) Rack travel in mm : 14.10...14.50 LOW IDLE Speed rpm: 350
Rack travel in mm: 5.40...5.60
Del.quantity cm3/: 16.0...22.0

1000 s: (13.5...24.5)

E16

Spread cm3 : 3.50 1000 s: (5.50)

Remarks:

Start-of-delivery mark = 12,5° after start of delivery cyl. 1.

Note remarks

Test sheet : LIE 5,6 a 1 : 07.02.89 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 400 874 238A

Injection pump

Pump designation : PES4A95D41ORS2685

: 0 410 894 996 EP type number

Governor

: RSV400...1000A1c2187 Governor design.

: 0 420 232 387 Governer no.

Customer-spec. information Customer : LIEBHERR

Engine : D904 NA

: 60.0 1st version kW Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 40...45

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening |

: 172...175 pressure, bar

Test lines : 1 680 750 008

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80

: (2.65...2.85)

Rack travel in mm : 9.00...12.00

: 1-3-4-2 Firing order

Phasina : 0-90-180-270

Tolerance + - 0 : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50 & maximum rack tra: 21.00

Difference ° CS : 4.00...5.00

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 9.00...9.10

Del.quantity cm3/: 7.5...7.7

100 s: (7.3...7.9)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 400.0Rack travel in mm : 6.3...6.5

Del.guantity cm3/: 1.0...1.6

100 s: (0.7...1.8)

Spread cm3 : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 2.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 75.0...77.0 1000 : (73.0...79.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 39...47

Testing: 1st rack travel in: 8.00 Speed rpm: 1040...1050 2nd rack travel in: 4.00 Speed rpm: 1045...1075

3rd rack travel in: 4.00

Speed rpm: 1070...1100

4th rack travel in: 1240 rpm : 0.30...1.40 Speed LOW IDLE 1 Control Lever position degrees: 13...21 Setting point w/out bumper spring rpm : 400 Rack travel in mm: 5.9 Testing: Speed rpm: 100 Minimum rack trave: 19.50 rpm : 400 Speed Rack travel in mm: 6.30...6.50 Rack travel in mm: 2.00 Speed : 510...570 rom TORQUE CONTROL Torque control curve - 1st version rpm : 1000 1st speed Rack travel in m: 9.00...9.10 2nd speed rpm : 500 Rack travel in m: 9.00...9.20 FUEL DELIVERY CHARACTERISTICS 1st version rpm : 600 Speed Del.quantity cm3/: 62.5...65.5 1000 s: (60.0...68.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 8.00 rpm : 1040...1050 Speed INTERMEDIATE RATED SPEED Rack travel in mm: 4.00 STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 120.0...130.0 1000 s: (117.0...133.0)

Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 6.30...6.50
Del.quantity cm3/ : 10.0...16.0
1000 s: (7.5...18.5)
Spread cm3 : 3.50

:

1000 s: (5.50)

Remarks:

E18

Note remarks

Test sheet : LIE 5,6 a 2 : 07.02.89 Edition

Replaces

: ISO-4113 Test oil

: 0 400 874 238B Combination no.

Injection pump

Pump designation : PES4A95D41ORS2685 : 0 410 894 996 EP type number

Governor

: RSV400...1000A1C2187 Governor design.

: 0 420 232 387 Governer no.

Customer-spec. information Customer : LIEBHERR

Engine : D904 NA

: 70.0 1st version kW Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 40...45

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening |

: 172...175 pressure, bar

Test lines : 1 680 750 008

Outside diameter

x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.70...2.80 Prestroke mm

: (2.65...2.85)

Rack travel in mm : 9.00...12.00 Firing order : 1-3-4-2

Phasing : 0-90-180-270

Tolerance + - 0 : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50 & maximum rack tra: 21.00 Difference ° CS : 4.00...5.00

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 10.20...10.30

Del.quantity cm3/: 8.6...8.8

100 s: (8.4...9.0)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 400.0 2nd speed Rack travel in mm: 6.3...6.5

Del.quantity cm3/ : 1.0...1.6

100 s: (0.7...1.8) cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 2.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del quantity : 86.0...88.0 1000 : (84.0...90.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 39...47

Testing: 1st rack travel in: 9.20 rpm : 1040...1050 Speed 2nd rack travel in: 4.00 rpm : 1045...1075 Speed 3rd rack travel in: 4.00 Speed rpm : 1075...1105 4th rack travel in: 1240 Speed rpm : 0.30...1.40 LOW IDLE 1 Control lever position degrees: 13...21 Setting point w/out bumper spring rpm : 400 Rack travel in mm : 5.9 Testing: Speed rpm: 100 Minimum rack trave: 19.50 rpm : 400 Speed Rack travel in mm : 6.30...6.50 Rack travel in mm : 2.00 Speed rpm : 510...570 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 10.20...10.30 2nd speed rpm : 500 Rack travel in m: 10.20...10.40 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 600 Del.quantity cm3/: 80.5...83.5 1000 s: (78.0...86.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 9.20 Speed rpm : 1040...1050 INTERMEDIATE RATED SPEED Rack travel in mm: 4.00 STARTING FUEL DELIVERY rpm : 100 Del.quantity cm3/: 120.0...130.0

1000 s: (117.0...133.0)

Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 400 Rack travel in mm : 6.30...6.50 Del.quantity cm3/: 10.0...16.0 1000 s: (7.5...18.5) Spread cm3 : 3.50 1000 s: (5.50)

:

Remarks:

E20

Note remarks

: LIE 5,6 a 3 : 07.02.89 Test sheet Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 400 874 238b

Injection pump

Pump designation : PES4A95D41ORS2685 : 0 410 894 996

EP type number

Governor

Governor design. : RSV400...1000A1C2187

Governer no.

: 0 420 232 387

Customer-spec. information Customer : LIEBHERR

: D904 NA Engine

1st version kW : 62.0 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 40...45

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter x Wall thickness

x Length mm

: 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80

: (2.65...2,85)

Rack travel in mm : 9.00...12.00

Firing order : 1-3-4-2

: 0-90-180-270 Phasing

Tolerance + - 0 : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50 & maximum rack tra: 21.00

Difference ° CS : 4.00...5.00

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 9.90...10.00

Del.quantity cm3/ : 7.7...7.9

100 s: (7.5...8.1)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 400.02nd speed Rack travel in mm : 6.3...6.5

Del.quantity cm3/: 1.0...1.6 100 s: (0.7...1.8) Spread cm3: 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 3.25

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed

: 77.0...79.0 Del.quantity 1000 : (75.0...81.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 44...52

Testing: 1st rack travel in: 8.90 Speed rpm : 1040...1050 2nd rack travel in: 4.00 rpm : 1055...1085 Speed 3rd rack travel in: 4.00 Speed rpm : 1075...1105 4th rack travel in: 1240 rpm : 0.30...1.40 Speed LOW IDLE 1 Control lever position degrees: 17...25 Setting point w/out bumper spring rpm : 400 Rack travel in mm: 5.9 Testing: Speed rpm : 100 Minimum rack trave: 19.50 rpm : 400 Speed Rack travel in mm: 6.30...6.50 Rack travel in mm: 2.00 Speed rpm: 520...580 TORQUE CONTROL Torque control curve - 1st version rpm : 1000 1st speed Rack travel in m: 9.90...10.00 2nd speed rpm : 500 Rack travel in m: 10.60...10.70 3rd speed rpm : 890 Rack travel in m: 10.30...10.50 FUEL DELIVERY CHARACTERISTICS 1st version rpm : 825 Speed Del.quantity cm3/: 82.5...85.5 1000 s: (80.0...88.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 8.90 rpm : 1040...1050 Speed INTERMEDIATE RATED SPEED Rack travel in mm: 4.00 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 120.0...130.0 1000 s: (117.0...133.0) Note remarks

: LIE 5,6 a 4 : 07.02.89 Test sheet Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 400 874 238E

Injection pump

Pump designation : PES4A95D41DRS2685 EP type number : 0 410 894 996

Governor

: RSV400...1000A1c2187 Governor design.

: 0 420 232 387 Governer no.

Customer-spec. information : LIEBHERR Customer

: D904 TB Engine

: 77.0 1st version kW : 2000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 40...45

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

: 172...175 pressure, bar

Test Lines : 1 680 750 008

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80

: (2.65...2.85)

Rack travel in mm : 9.00...12.00 Firing order : 1-3-4-2

: 0-90-180-270 Phasing

Tolerance + - 0 : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50

& maximum rack tra: 21.00

Difference ° CS : 4.00...5.00

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 11.20...11.30

Del.quantity cm3/: 9.9...10.1

100 s: (9.7...10.3)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 400.0 2nd speed

Rack travel in mm: 6.3...6.5 Del.quantity cm3/: 1.0...1.6

100 s: (0.7...1.8)

cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 2.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed

: 99.0...101.0 Del.quantity

1000 : (97.0...103.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 42...50

Testina:

1st rack travel in: 10.20

rpm : 1040...1050 Speed 2nd rack travel in: 4.00

rpm : 1050...1080 Speed

3rd rack travel in: 4.00

Speed rpm : 1070...1100 4th rack travel in: 1235 Speed rpm : 0.30...1.40

LOW IDLE 1 Control lever

position degrees: 15...23

Setting point w/out bumper spring

rpm : 400 Rack travel in mm : 5.9

Testina:

Speed rpm : 100 Minimum rack trave: 19.50 rpm : 400 Speed

Rack travel in mm : 6.30...6.50 Rack travel in mm : 2.00

: 515...575 Speed rom

TORQUE CONTROL

Dimension a mm : 1.15

Torque control curve - 1st version

rpm : 1000 1st speed

Rack travel in m: 11.20...10.30 2nd speed rpm : 500 Rack travel in m: 12.40...12.50

: 820 3rd speed rpm

Rack travel in m: 11.70...11.90

FUEL DELIVERY CHARACTERISTICS

1st version

: 750 Speed rpm

Del.quantity cm3/: 112.0...115.0 1000 s: (109.5...117.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.20

rpm : 1040...1050 Speed

INTERMEDIATE RATED SPEED

Rack travel in mm: 4.00

STARTING FUEL DELIVERY

Speed : 100 rpm

Del.quantity cm3/: 120.0...130.0 1000 s: (117.0...133.0)

Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 400 Rack travel in mm : 6.30...6.50

Del.quantity cm3/: 10.0...16.0 1000 s: (7.5...18.5)

cm3 : 3.50Spread 1000 s: (5.50)

Remarks:

F24

Note remarks

Test sheet : LIE 5,6 a 5 Edition : 07.02.89

Replaces

Test oil : ISO-4113

Combination no. : 0 400 874 238F

Injection pump

Pump designation : PES4A95D410RS2685

EP type number : 0 410 894 996

Governor

Governor design. : RSV400...1000A1c2187

: 0 420 232 387 Governer no.

Customer-spec. information Customer : LIEBHERR

: D904 T Engine

: 81.0 1st version kW : 2000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 40...45

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test Lines : 1 680 750 008

Outside diameter

x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.70...2.80 Prestroke mm

: (2.65...2.85)

Rack travel in mm : 9.00...12.00 Firing order : 1-3-4-2

Phasing : 0-90-180-270

Tolerance + - 0 : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50 & maximum rack tra: 21.00 Difference ° CS : 4.00...5.00

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 12.10...12.20

Del.quantity cm3/: 11.3...11.5

100 s: (11.1...11.7)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 400.02nd speed Rack travel in mm: 6.3...6.5

Del.quantity cm3/: 1.0..1.6 100 s: (0.7...1.8) Spread cm3: 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION Control-Lever position

Degree: -3 rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 2.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed

Speed Del.quantity 1000 : 113.0...115.0

: (111.0...117.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version

Control Lever

position degrees: 42...50

Testing: 1st rack travel in: 11.10 rpm : 1040...1050 Speed 2nd rack travel in: 4.00 Speed rpm: 1050...1080 3rd rack travel in: 4.00 rpm : 1080...1110 Speed 4th rack travel in: 1245 Speed rpm : 0.30...1.40LOW IDLE 1 Control Lever position degrees: 15...23 Setting point w/out bumper spring Speed rpm : 400 Rack travel in mm: 5.9 Testing: Speed rpm : 100 Minimum rack trave: 19.50 rpm : 400 Speed Rack travel in mm : 6.30...6.50 Rack travel in mm : 2.00 : 515...575 Speed rpm TORQUE CONTROL Torque control curve - 1st version rpm : 1000 1st speed Rack travel in m: 12.10...12.20 2nd speed rpm : 500
Rack travel in m: 12.60...12.60
3rd speed rpm : 880 Rack travel in m: 12.30...12.50 FUEL DELIVERY CHARACTERISTICS 1st version : 900 Speed rpm Del.quantity cm3/: 121.0...124.0 1000 s: (118.5...126.5) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 11.10 Speed rpm : 1040...1050 INTERMEDIATE RATED SPEED Rack travel in mm: 4.00 STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 120.0...130.0 1000 s: (117.0...133.0) Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 6.30...6.50
Del.quantity cm3/ : 10.0...16.0
1000 s: (7.5...18.5)
Spread cm3 : 3.50
1000 s: (5.50)

:

Remarks:

**E26** 

Note remarks

: LIE 5,6 a 6 : 07.02.89 Test sheet Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 400 874 238G

Injection pump

: PES4A95D410RS2685 Pump designation

: 0 410 894 996 EP type number

Governor

: RSV400...1000A1C2187 Governor design.

: 0 420 232 387 Governer no.

Customer-spec. information Customer : LIEBHERR

: 0904 T Engine

: 88.0 1st version kW : 2000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 40...45

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test Lines : 1 680 750 008

Outside diameter

x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.70...2.80 Prestroke mm

: (2.65...2.85)

Rack travel in mm : 9.00...12.00 Firing order : 1-3-4-2

Phasing : 0-90-180-270

Tolerance + - 0 : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50

& maximum rack tra: 21.00

Difference ° CS : 4.00...5.00

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 13.00...13.10

Del.quantity cm3/: 12.5...12.7

100 s: (12.3...12.9)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 400.02nd speed

Rack travel in mm: 6.3...6.5 Del.quantity cm3/: 1.0...1.6

100 s: (0.7...1.8)

cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

Speed rpm: 800 Rack travel in mm: 0.30...0.70

Governor spring pre-tension

Click setting x : 2.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed : 1000 rpm

Del.quantity 125.0...127.0

: (123.0...129.0) 1000

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 40...48

Testing:

1st rack travel in: 12.00

: 1040...1050 Speed rpm

2nd rack travel in: 4.00

rpm : 1045...1075 Speed

3rd rack travel in: 4.00

Speed rpm : 1080...1110 4th rack travel in: 1245

rpm : 0.30...1.40 Speed

LOW IDLE 1

Control lever

position degrees: 13...21

Setting point w/out bumper spring

rpm : 400 Rack travel in mm : 5.9

Testing:

rpm : 100 Speed

Minimum rack trave: 19.50

rpm : 400 Speed

Rack travel in mm : 6.30...6.50 Rack travel in mm : 2.00

rpm : 510...570 Speed

TORQUE CONTROL

Torque control curve - 1st version

rpm : 1000 1st speed

Rack travel in m: 13.00...13.10

2nd speed rpm : 500

Rack travel in m: 13.00...13.20

FUEL DELIVERY CHARACTERISTICS

1st version

Speed : 500 rpm

Del.quantity cm3/: 113.5...116.5

1000 s: (111.0...119.0)

rpm : 700 Speed

Del.quantity cm3/: 119.0...122.0 1000 s: (116.5...124.5)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 12.00

rpm : 1040...1050 Speed

INTERMEDIATE RATED SPEED

Rack travel in mm: 4.00

STARTING FUEL DELIVERY

: 100

Speed rpm Del.quantity cm3/: 120.0...130.0 1000 s: (117.0...133.0)

Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 6.30...6.50
Del.quantity cm3/ : 10.0...16.0
1000 s: (7.5...18.5)
Spread cm3 : 3.50

1000 s: (5.50)

Remarks:

**F28** 

Note remarks

: LIE 5,6 a 7 : 07.02.89 Test sheet Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 400 874 238H

Injection pump

Pump designation : PES4A95D41ORS2685

EP type number : 0 410 894 996

Governor

Governor design. : RSV400...1000A1C2187

: 0 420 232 387 Governer no.

Customer-spec. information Customer : LIEBHERR

: 0904 TB Engine

: 67.0 1st version kW : 2000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 40...45

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.70...2.80 Prestroke mm

: (2.65...2.85)

Rack travel in mm : 9.00...12.00

Firing order : 1-3-4-2

: 0-90-180-270 Phasing

Tolerance + - 0 : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50

& maximum rack tra: 21.00

Difference ° (S : 4.00...5.00

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 10.50...10.60

Del.quantity cm3/: 9.2...9.4

100 s: (9.0...9.6)

cm3 : 0.3Spread

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 6.3...6.5 Del.quantity cm3/: 1.0...1.6

100 s: (0.7...1.8)

cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

: 1000 Speed rpm

: 92.0...94.0 Del.quantity

1000 : (90.0...96.0)

: 3.50 Spread cm3

: (6.00) 1000

RATED SPEED

1st version

Control lever

position degrees: 41...49

Testing: 1st rack travel in: 9.50 Speed rpm : 1040...1050 2nd rack travel in: 4.00 Speed rpm : 1045...1075 3rd rack travel in: 4.00 rpm : 1075...1105 Speed 4th rack travel in: 1240 rpm : 0.30...1.40Speed LOW IDLE 1 Control lever position degrees: 14...22 Setting point w/out bumper spring Speed rpm : 400 Rack travel in mm : 5.9 Testina: Speed rpm : 100 Minimum rack trave: 19.50 rpm : 400 Speed Rack travel in mm: 6.30...6.50 Rack travel in mm: 2.00 : 515...575 Speed rom TORQUE CONTROL Torque control curve - 1st version rpm : 1000 1st speed Rack travel in m: 10.50...10.60 rpm : 500 2nd speed Rack travel in m: 10.90...11.00 3rd speed rpm : 900 Rack travel in m: 10.70...10.90 FUEL DELIVERY CHARACTERISTICS 1st version : 800 Speed rpm Del.quantity cm3/: 98.0...101.0 1000 s: (95.5...103.5) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 9.50 rpm : 1040...1050 Speed INTERMEDIATE RATED SPEED Rack travel in mm : 4.00 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 120.0...130.0 1000 s: (117.0...133.0) Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 6.30...6.50
Del.quantity cm3/ : 10.0...16.0
1000 s: (7.5...18.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

F02

Note remarks

Test sheet : LIE 5,6 a 8 : 07.02.89 Edition

Replaces : ISO-4113 Test oil

Combination no. : 0 400 874 238J

Injection pump

Pump designation : PES4A950410RS2685 EP type number : 0 410 894 996

Governor

Governor design. : RSV400...1000A1c2187

: 0 420 232 387 Governer no.

Customer-spec. information Customer : LIEBHERR

: D904 T Engine

1st version kW : 90.0 : 2000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 40...45

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27

: 2.70...2.80 Prestroke mm

: (2.65...2.85)

Rack travel in mm : 9.00...12.00 Firing order : 1-3-4-2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50 & maximum rack tra: 21.00

Difference ° CS : 4.00...5.00

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 12.50...12.60

Del.guantity cm3/: 12.1...12.3

100 s: (11.9...12.5)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 400.0 2nd speed Rack travel in mm : 6.3...6.5 Del.quantity cm3/ : 1.0...1.6 100 s: (0.7...1.8)

cm3 : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

Speed rpm: 800 Rack travel in mm: 0.30...0.70

Governor spring pre-tension Click setting x : 2.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Spread

: 1000 Speed rpm

: 121.5...123.5 : (119.5...125.5) Del.quantity 1000

: 3.50 cm3 Spread

1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 40...48

Testing: 1st rack travel in: 11.50 Speed rpm : 1040...1050 2nd rack travel in: 4.00 Speed rpm : 1050...1080 3rd rack travel in: 4.00 rpm : 1080...1110 Speed 4th rack travel in: 1245 rpm : 0.30...1.40 Speed LOW IDLE 1 Control lever position degrees: 13...21 Setting point w/out bumper spring Speed rpm : 400 Rack travel in mm : 5.9 Testing: Speed rpm : 100 Minimum rack trave: 19.50 rpm : 400 Rack travel in mm: 6.30...6.5 Rack travel in mm: 2.00 rpm : 510...570 Speed TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 12.50...12.60 rpm : 500 2nd speed Rack travel in m: 12.50...12.70 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.50 rpm : 1040...1050 Speed INTERMEDIATE RATED SPEED Rack travel in mm: 4.00 STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 120.0...130.0 1000 s: (117.0...133.0) Rack travel in mm: 19.50...21.00 LOW IDLE Speed rpm : 400 Rack travel in mm : 6.30...6.50 Del.quantity cm3/: 10.0...16.0 1000 s: (7.5...18.5) Spread cm3 : 3.50 1000 s: (5.50)

Remarks:

F04

Note remarks

: LIE 8,4 a 1 Test sheet Edition : 07.02.89

Replaces

Test oil : ISO-4113

: 0 400 876 322A Combination no.

Injection pump

Pump designation : PES6A95D410RS2689

EP type number : 0 410 896 916

Governor

Governor design. : RSV400...1000A1c2187

: 0 420 232 387 Governer no.

Customer-spec. information Customer : LIEBHERR

: D906 NA Engine

1st version kW : 112.0 : 2000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 40...45

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

pressure, bar : 172...175

: 1 680 750 008 Test Lines

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. vetues in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.70...2.80 Prestroke mm

: (2.65...2.85)

Rack travel in mm : 9.00...12.00

: 0-60-120-180-240-300 Phasina

: 1-5-3-6-2-4

Tolerance + - 0 : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50

& maximum rack tra: 21.00 Difference CS: 4.00...5.00

BASIC SETTING

Firing order

rpm: 1000 1st speed

Rack travel in mm : 10.40...10.50

Del.quantity cm3/: 8.7...8.9

100 s: (8.5...9.1)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 400.0 2nd speed Rack travel in mm : 6.3...6.5 Del.quantity cm3/ : 1.0...1.6

100 s: (0.7...1.8)

cm3 : 0.3Spread 100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed

Del.quantity : 87.0...89.0 1000 : (85.0...91.0) cm3 : 3.50

Spread

: (6.00) 1000

RATED SPEED

1st version Control lever

position degrees: 39...47

Testina: 1st rack travel in: 9.40 Speed rpm : 1040...1050 2nd rack travel in: 4.00 rpm : 1045...1075 Speed 3rd rack travel in: 4.00 Speed rpm : 1075...1105 4th rack travel in: 1240 Speed rpm : 0.30...1.40

LOW IDLE 1 Control lever

position degrees: 13...21 Setting point w/out bumper spring

rpm : 400 Rack travel in mm: 5.9

Testina:

Speed rpm : 100 Minimum rack trave: 19.50 rpm : 400 Speed Rack travel in mm : 6.30...6.50 Rack travel in mm : 2.00 : 515...575 Speed rpm

TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000

Rack travel in m: 10.40...10.50

2nd speed rpm : 500 Rack travel in m: 10.40...10.60

FUEL DELIVERY CHARACTERISTICS

1st version

rpm : 600 Speed Del.quantity cm3/: 77.5...80.5

1000 s: (75.0...83.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 9.40 rpm : 1040...1050 Speed

INTERMEDIATE RATED SPEED Rack travel in mm: 4.00

STARTING FUEL DELIVERY

LOW IDLE

Speed rpm : 400 Rack travel in mm : 6.30...6.50

Del.quantity cm3/: 10.0...16.0 1000 s: (7.5...18.5) Spread cm3 : 3.50 1000 s: (5.50)

Remarks:

F06

Note remarks

Test sheet : LIE 8,4 a 2 : 07.02.89 Edition

Replaces

: ISO-4113

Test oil

Combination no. : 0 400 876 322B

Injection pump

Pump designation : PES6A95D41ORS2689 EP type number : 0 410 896 916

Governor

: RSV400...1000A1c2187 Governor design.

Governer no. : 0 420 232 387

Customer-spec. information Customer : LIEBHERR

: D906 TB Engine

: 118.0 1st version kW : 2000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 40...45

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test Lines : 1 680 750 008

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.70...2.80 Prestroke mm

: (2.65...2.85)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - 0 : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50 & maximum rack tra: 21.00

Difference ° CS : 4.00...5.00

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 11.20...11.30

Del.quantity cm3/: 9.9...10.1

100 s: (9.7...10.3)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 400.0 2nd speed Rack travel in mm: 6.3...6.5 Del.quantity cm3/: 1.0...1.6 100 s: (0.7...1.8)

Spread cm3 : 0.3100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 2.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed

: 99.0...101.0 : (97.0...103.0) : 3.50 Del.quantity 1000

cm3 Spread 1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 39...47

F07

Testing: 1st rack travel in: 10.20 rpm : 1040...1050 Speed 2nd rack travel in: 4.00 rpm : 1045...1075 Speed 3rd rack travel in: 4.00 Speed rpm : 1060...1090 4th rack travel in: 1225 Speed rpm : 0.30...1.40 LOW IDLE 1 Control Lever position degrees: 13...21 Setting point w/out bumper spring Speed rpm : 400 Rack travel in mm : 5.9 Testing: rpm : 100 Speed Minimum rack trave: 19.50 rpm : 400 Rack travel in mm : 6.30...6.50 Rack travel in mm : 2.00 : 510...570 Speed rpm TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 11.20...11.30 rpm : 500 2nd speed Rack travel in m: 12.40...12.50 3rd speed rpm : 870 Rack travel in m: 11.80...12.00 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 750 Del.quantity cm3/ : 113.0...116.0 1000 s: (110.5...118.5) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 10.20 rpm : 1040...1050 Speed INTERMEDIATE RATED SPEED Rack travel in mm: 4.00 STARTING FUEL DELIVERY

: 100

Del.quantity cm3/: 120.0...130.0 1000 s: (117.0...133.0)

rpm

Remarks:

•

Speed

Note remarks

Test sheet : LIE 8,4 a 3 : 07.02.89 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 400 876 322c

Injection pump

Pump designation : PES6A95D41ORS2689

: 0 410 896 916 EP type number

Governor

: RSV400...1000A1c2187 Governor design.

: 0 420 232 387 Governer no.

Customer-spec. information Customer : I TEBHERR

: D906 T Engine

: 132.0 1st version kW : 2000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 40...45

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

**Openina** 

: 172...175 pressure, bar

: 1 680 750 008 Test lines

Outside diameter

x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27

: 2.70...2.80 Prestroke mm

: (2.65...2.85)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasina

Tolerance + - ° : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50 & maximum rack tra: 21.00 Difference ° CS : 4.00...5.00

BASIC SETTING

rpm : 10001st speed

Rack travel in mm : 12.10...12.20

Del.guantity cm3/: 11.5...11.7

100 s: (11.3...11.9)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 400.0 2nd speed Rack travel in mm: 6.3...6.5 Del.quantity cm3/: 1.0...1.6

100 s: (0.7...1.8) Spread cm3 : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3
Speed rpm: 800
Rack travel in mm: 0.30...0.70

Governor spring pre-tension Click setting x : 2.25

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed

: 115.0...117.0 Del.quantity : (113.0...119.0) : 3.50 1000

cm3

Spread : (6.00) 1000

RATED SPEED

1st version

Control lever

position degrees: 40...48

Testina: 1st rack travel in: 11.10 Speed rpm : 1040...1050 2nd rack travel in: 4.00 rpm : 1045...1075 Speed 3rd rack travel in: 4.00 Speed rpm : 1075...1105 4th rack travel in: 1240 Speed rpm : 0.30...1.40 LOW IDLE 1 Control lever position degrees: 14...22 Setting point w/out bumper spring rpm : 400 Rack travel in mm: 5.9 Testing: rpm : 100 Speed Minimum rack trave: 19.50 rpm : 400 Rack travel in mm : 6.30...6.50 Rack travel in mm : 2.00 Speed rpm : 530...590 Speed TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 12.10...12.20 2nd speed rpm : 500 Rack travel in m: 12.40...12.50
3rd speed rpm : 910
Rack travel in m: 12.20...12.40 FUEL DELIVERY CHARACTERISTICS 1st version rpm : 800 Speed Del.quantity cm3/: 118.0...121.0 1000 s: (115.5...123.5) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.10 rpm : 1040...1050 Speed INTERMEDIATE RATED SPEED Rack travel in mm: 4.00

F10

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 120.0...130.0

1000 s: (117.0...133.0)

Note remarks

Test sheet : MB 6,0 c 2 Edition : 03.03.89 Replaces : 24.6.88 : ISO-4113 Test oil

Combination no. : 0 400 876 335

Injection pump

Pump designation : PES6A90D410RS2710 EP type number : 0 410 896 082

Governor

: RSV350...1200A1C1154 Governor design.

: 0 420 232 468 Governer no.

Customer-spec. information

Customer : DAIMLER-BENZ

: OM 366 Engine

: 74.0 1st version kW Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening.

: 172...175 pressure, bar

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.25...2.35 : (2.20...2.40) Prestroke mm

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - 0 : 0.50 (0.75)

BASIC SETTING

rpm: 1200 1st speed

Rack travel in mm : 9.30...9.40

Del.quantity cm3/: 5.1...5.2

100 s: (4.9...5.4)

cm3 : 0.3Spread

100 s: (0.4)

2nd speed rpm : 370.0 Rack travel in mm : 7.9...8.5

Del.quantity cm3/: 1.0...1.2 100 s: (0.8...1.4)

cm3 : 0.2 Spread

100 s: (0.4)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1200 Speed

: 51.0...52.0 Del.quantity 1000 : (49.0...54.0)

: 3.00 Spread cm3

: (4.50) 1000

RATED SPEED

1st version

Control lever

position degrees: 59...67 2nd rack travel in: 8.30 Speed rpm : 1250...1245

3rd rack travel in: 4.00

rpm : 1267...1280 Speed

4th rack travel in: 1400

: 0.30...1.40 Speed rpm

LOW IDLE 1 Control lever position degrees: -3 Setting point w/out bumper spring : 370 rpm Rack travel in mm: 8.2 Testing: : 100 Speed rpm Minimum rack trave: 19.50 Speed rpm : 370 Rack travel in mm : 8.10...8.30 Rack travel in mm : 2.00 : 460...520 Speed rpm TORQUE CONTROL Torque control curve - 1st version rpm : 1200 1st speed Rack travel in m: 9.30...9.40 : 600 2nd speed rpm Rack travel in m: 10.00...10.20 rpm : 900 3rd speed Rack travel in m: 9.80...10.10 FUEL DELIVERY CHARACTERISTICS 1st version : 600 Speed rpm Del.quantity cm3/: 41.0...43.0 1000 s: (38.5...45.5) : 900 Speed rpm Del.quantity cm3/: 46.0...49.0 1000 s: (43.5...51.5) STARTING FUEL DELIVERY : 100 Speed rpm Del.quantity cm3/: 85.0...95.0 1000 s: (82.0...98.0) Rack travel in mm : 16.80...17.20 LOW IDLE Speed rpm Rack travel in mm : 7.90...8.50 Del.quantity cm3/: 10.0...12.0 1000 s: (8.0...14.0) cm3 : 2.50 Spread 1000 s: (4.50) Remarks: **APPLICATION** Unimog

Note remarks

: MB 6.0 c 3 : 03.03.89 Test sheet Edition Replaces : 2.9.88 Test oil : ISO-4113

: 0 400 876 336 Combination no.

Injection pump

Pump designation : PES6A90D410RS2710 EP type number : 0 410 896 082

Governor

Governor design. : RSV350...1200A1C1154

-1L

: 0 420 232 470 Governer no.

Customer-spec. information

Customer : DAIMLER-BENZ

Engine : OM 366

: 81.0 1st version kW Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

: 172...175 pressure, bar

Test lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. Values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.25...2.35 Prestroke mm

: (2.20...2.40)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - 0 : 0.50 (0.75)

BASIC SETTING

rpm: 1200 1st speed

Rack travel in mm : 9.80...9.90

Del.quantity cm3/: 5.3...5.4

100 s: (5.1...5.6)

Spread cm3 : 0.3

100 s: (0.4)

2nd speed rpm : 370.0 Rack travel in mm : 7.8...8.4 Del.quantity cm3/: 1.0...1.2

100 s: (0.8...1.4)

cm3 : 0.2 Spread 100 s: (8.4)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 1200 : 53.0...54.0 Del.quantity : (51.0...56.0) 1000

: 3.00 Spread cm3

1000 : (4.50)

RATED SPEED

1st version

Control lever

position degrees: 59...67

Testing:

1st rack travel in: 8.80

Speed rpm : 1240...1245 3rd rack travel in: 4.00

rpm : 1295...1325 Speed

4th rack travel in: 1400

rpm : 0.30...1.40Speed LOW IDLE 1 Control lever position degrees: -3 Setting point w/out bumper spring rom : 370 Rack travel in mm: 8.1 Testing: Speed rpm Minimum rack trave: 19.50 Speed rpm : 370
Rack travel in mm : 8.00...8.20
Rack travel in mm : 2.00 Speed : 470...530 rpm TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1200 Rack travel in m: 9.80...9.90 2nd speed rpm : 600 Rack travel in m: 11.30...11.40 rpm : 850 3rd speed Rack travel in m: 11.10...11.30 in speed rpm : 950 4th speed Rack travel in m: 10.30...10.60 FUEL DELIVERY CHARACTERISTICS 1st version : 600 Speed rpm Del.quantity cm3/: 50.0...52.0 1000 s: (47.5...54.5) : 850 Speed rpm Del.quantity cm3/: 51.0...54.0 1000 s: (48.5...56.5) STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 85.0...95.0 1000 s: (82.0...98.0) Rack travel in mm: 17.10...17.50 LOW IDLE Speed rpm : 370 Rack travel in mm : 7.80...8.40 Del.quantity cm3/: 10.0...12.0 1000 s: (8.0...14.0) cm3 : 2.50 Spread 1000 s: (84.50) Remarks: :

APPLICATION

Unimog

F14

Note remarks

: RAB 9,7 d 1 : 13.05.87 Test sheet Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 400 876 340

Injection pump

Pump designation : PES6A95D410RS2108R

EP type number : 0 410 896 927

Governor

: RSV550...1100A1C607-Governor design.

: 0 420 232 486 Governer no.

Customer-spec. information Customer : RABA

: D2356 HM6 Engine

: 150.0 1st version kW Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.00

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 1.70...1.80 Prestroke mm

: (1.65...1.85)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

: 0.50 (0.75) Tolerance + - ⁰

Time to cyl. no. : 1

BASIC SETTING

rpm: 1080 1st speed

Rack travel in mm : 13.40...13.50

Del.quantity cm3/: 12.2...12.4

100 s: (12.0...12.6)

cm3 : 0.3Spread

100 s: (0.6)

2nd speed rpm : 550.0Rack travel in mm: 6.9...7.1 Del.quantity cm3/: 1.3...1.9

100 s: (1.0...2.1) cm3 : 0.3 Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 3.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

Speed rpm : 1080

: 122.0...124.0 Del.quantity 1000 : (120.0...126.0)

: 3.50 Spread cm3 1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 48...56

Testing:

1st rack travel in: 12.40

rpm : 1120...1130 Speed

2nd rack travel in: 4.00

rpm : 1145...1175 Speed 3rd rack travel in: 4.00 Speed rpm : 1175...1205 4th rack travel in: 1340 rpm : 0.30...1.40 Speed LOW IDLE 1 Control lever position degrees: 24...32 Setting point w/out bumper spring \_\_\_\_\_rpm : 550` Speed Rack travel in mm: 6.0 Testing: Speed rpm : 100 Minimum rack trave: 19.50 rpm : 550 Rack travel in mm : 6.40...6.60 Rack travel in mm : 2.00 rpm : 635...695 Speed TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1080 Rack travel in m: 13.40...13.50 rpm : 400 2nd speed Rack travel in m: 13.40...13.60 3rd speed rpm : 250 Rack travel in m: 14.60...15.20 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 500 Del.quantity cm3/ : 0.0...124.5 1000 s: (0.0...127.0) rpm : 700 Speed Del.quantity cm3/: 120.0...123.0 1000 s: (117.5...125.5) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 12.40

: 1120...1130

rpm

F16

Speed

Remarks:

Note remarks

Test sheet : RAB 10,8 b Edition : 10.02.89 : 12.9.86 Replaces Test oil : ISO-4113

Combination no. : 0 401 246 013

Injection pump

Pump designation : PES6A100D410RS3039

EP type number : 0 411 206 018

Governor

Governor design. : RQ200/1100AB1215L

: 0 420 200 102 Governer no.

Customer-spec. information Customer : RABA

: D2156 MTKLL 6 Engine

1st version kW : 206.0 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Openina (

: 172...175 pressure, bar

Test Lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 1.60...1.70 Prestroke mm : (1.55...1.75)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no.

BASIC SETTING

rpm: 1100 1st speed

Rack travel in mm : 13.40...13.50

Del.quantity cm3/: 15.0...15.2

100 s: (14.8...15.4)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 200.0 2nd speed

Rack travel in mm: 6.7...6.9

Del.quantity cm3/: 1.0...1.6 100 s: (0.7...1.8)

cm3 : 0.3 Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100 Aneroid pressure h: 700

Anerota Del.quantity 1000 : 150.0...152.0 : (148.0...154.0)

: 3.00 Spread cm3

1000 : (6.00)

RATED SPEED

1st version

Setting point:

Speed : 600 man Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.50

rpm : 1145...1160 Speed

2nd rack travel in: 4.00

: 1205...1235 Speed rom

F17

LOW IDLE 1

Setting point w/out bumper spring

rpm : 200 Rack travel in mm: 6.8

Testing:

Speed rpm : 100 Minimum rack trave: 8.20

Speed rpm: 200
Rack travel in mm: 6.70...6.90
Rack travel in mm: 2.00
Speed rpm: 325...365

TORQUE CONTROL

Dimension a mm : 0.55

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 13.40...13.50

2nd speed rpm : 600

Rack travel in m: 14.70...14.80

rpm : 880 3rd speed

Rack travel in m: 14.00...14.20

rpm : 945 4th speed

Rack travel in m: 13.50...13.80

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 500 hPa : 700 Pressure

Rack travel mm : 14.60...14.80

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 10.70...10.80

2nd pressure hPa : 450

Rack travel in m: 13.70...13.80
3rd pressure hPa : 325
Rack travel in m: 12.10...12.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700 Speed rpm : 750 Del.quantity cm3/ : 163.0...166.0 1000 s: (160.5...168.5)

Aneroid pressure h: -

rpm\_ : 500 Speed

Del.quantity cm3/: 92.5...94.5

1000 s: (90.5...96.5)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 12.50

rpm : 1145...1160 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity\_cm3/ : 205.0...215.0 1000 s: (202.0...218.0)

Rack travel in mm : 19.50...21.00

Remarks:

F18

Note remarks

Test sheet : MAN 20,9 j : 10.02.89 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 401 840 109

Injection pump

Pump designation : PE12P120A520/4LS857

EP type number : 0 411 820 035

Governor

Governor design. : RQV250...1050PA889

: 0 421 813 696 Governer no.

Customer-spec. information Customer : MAN

: D2542TE60 Engine

1st version kW : 361.0 : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Openina

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 074

Outside diameter x Wall thickness

: 8.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.00...3.10 : (2.95...3.15) Prestroke mm

Rack travel in mm : 9.00...12.00

: 12- 1- 5- 9- 8- 3-4- 11- 10- 2- 6- 7 Firing order

: 0-45-60-105-120-165-180-225-240-285-300-Phasing

: 345 Phasing

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 12

BASIC SETTING

rpm: 1050 1st speed

Rack travel in mm : 11.80...11.90

Del.quantity cm3/: 14.5...14.7

100 s: (14.2...15.0)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 250.02nd speed Rack travel in mm: 6.5...6.7 Del.quantity cm3/: 1.7...2.3

100 s: (1.4...2.6)

cm3 : 0.8 Spread 100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 250 1st speed

travel mm : 0.80...1.20

2nd speed : 700 rpm

: 4.60...5.00 travel mm

: 1050 3rd speed rpm

: 7.40...7.60 travel mm

: 1400 4th speed rpm

: 11.00...12.00 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1125 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Del.quantity : 145.0...147.0 1000 : (142.0...150.0) Spread cm3 : 5.00 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 58...66 Testing: 1st rack travel in: 10.80 rpm : 1090...1100 Speed 2nd rack travel in: 4.00 rpm : 1185...1215 Speed 4th rack travel in: 1400 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 8...16 Testing: Speed : 100 rpm Minimum rack trave: 8.10 Speed : 250 rpm Rack travel in mm : 6.50...6.70 CONSTANT REGULATION rpm : 400...520 Speed START CUT-OUT 1/min: 190 (210) Speed **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.80 rpm : 1090...1100 Speed STARTING FUEL DELIVERY Speed : 100 rpm LOW IDLE Speed : 250 rpm Rack travel in mm : 6.50...6.70 Del.quantity cm3/: 17.0...23.0 1000 s: (14.0...26.0) Spread cm3 : 8.00

1000 s: (12.00)

: MAN-NR. 2-7906

APPLICATION

Rail car

Remarks:

F20

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet Edition : FIA 13.8 a : 10.02.89 Replaces : 1.9.88 Test oil : ISO-4113 Combination no. : 0 401 846 225 Injection pump Pump designation : PE6P120A720RS167 EP type number : 0 411 826 053 Governor Governor design. : RQ225/1100PA118 : 0 421 801 027 Governer no. Customer-spec. information Customer : IVECO-FIAT Engine : 221A

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

x Length mm : 6.00X1.50X1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27

: 2.00...2.10 Prestroke mm : (1.95...2.15) Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 11.10...11.20

Del.guantity cm3/: 17.0...17.2

100 s: (16.7...17.5)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 225.0 Rack travel in mm : 7.5...7.7 Del.quantity cm3/: 1.7...2.3

100 s: (1.4...2.6)

cm3 : 0.8 Spread 100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position Degree: -1

rpm : 600

Rack travel in mm : 15.20...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1100 Speed

: 170.0...172.0 Del.quantity 1000 : (167.0...175.0)

Spread : 5.00 cm3 : (9.00) 1000

RATED SPEED

1st version

Setting point:

rpm Rack travel in mm : 15.8

Testing:

1st rack travel in: 10.10

Speed rpm : 1145...1160

2nd rack travel in: 4.00 Speed rpm : 1195...1225 4th rack travel in: 1350

rpm : 0.00...1.00 Speed

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 225 Rack travel in mm : 7.6

Testing:

rpm : 100 Speed Minimum rack trave: 9.10

Speed rpm : 225
Rack travel in mm : 7.50...7.70
Rack travel in mm : 2.00
Speed rpm : 365...405

TORQUE CONTROL

Dimension a mm : -

Torque control curve - 1st version 1st speed rpm : 1100 Rack travel in m: 11.10...11.20

2nd speed rpm : 600

Rack travel in m: 11.10...11.30

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 10.10

rpm : 1145...1160 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : FIA 13,8 a6 Test sheet : 10.02.89 Edition : 3.83 Replaces Test oil : ISO-4113 Combination no. : 0 401 846 356 Injection pump Pump designation : PE6P120A720RS167 : 0 411 826 053 EP type number Governor Governor design. : RQ225/1100PA323R : 0 421 801 065 Governer no. Customer-spec. information Customer : IVECO-FIAT : 221A Engine TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly **Openina** pressure, bar : 207...210 Orifice plate diameter mm : 0,8 Test lines : 1 680 750 067 Outside diameter x Wall thickness : 6.00x1.50x1000 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

: 0-60-120-180-240-300 Phasing Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING rpm: 1100 1st speed Rack travel in mm : 11.10...11.20 Del.guantity cm3/: 17.0...17.2 100 s: (16.7...17.5) cm3 : 0.5Spread 100 s: (0.9) 2nd speed rpm : 225.0 Rack travel in mm : 7.5...7.7 Del.quantity cm3/: 1.7...2.3 100 s: (1.4...2.6) cm3 : 0.8Spread 100 s: (1.2) GUIDE SLEEVE POSITION Control-lever position Degree: -1 Speed rpm : 550 Rack travel in mm : 15.20...16.40 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 1100 Speed : 170.0...172.0 Del.quantity 1000 : (167.0...175.0) : 5.00 cm3 Spread 1000 : (9.00) RATED SPEED 1st version Setting point: rpm Rack travel in mm : 15.8 Testing: 1st rack travel in: 10.10 rpm : 1145...1160 Speed 2nd rack travel in: 4.00 rpm : 1190...1220 Speed 4th rack travel in: 1350

: 1-5-3-6-2-4

Firing order

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10 : (1.95...2.15)
Rack travel in mm : 9.00...12.00

: 0.00...1.00 Speed rpm

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 225 Rack travel in mm : 7.6

Testing:

Speed : 100 rpm Minimum rack trave: 9.10
Speed rpm : 225
Rack travel in mm : 7.50...7.70
Rack travel in mm : 2.00
Speed rpm : 365...405

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version 1st speed rpm : 1100 Rack travel in m: 11.10...11.20

rpm : 550 2nd speed

Rack travel in m: 11.10...11.30

#### **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 10.10

rpm : 1145...1160 Speed

STARTING FUEL DELIVERY

Speed rom : 100

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

Note remarks Test sheet Edition : FIA 13,8a10 : 10.02.89 Replaces Test oil : ISO-4113 Combination no. : 0 401 846 365 Injection pump : 0 411 826 053 EP type number Governor Customer-spec. information : IVECO-FIAT Customer : 221A Engine Test oil inlet temp. °C : 38...42 : 1 417 413 025 : 1 688 901 019 assembly pressure, bar : 207...210 : 0,8 diameter mm : 1 680 750 067 : 6.00x1.50x1000 Insp. values in parentheses Set equal delivery quant. per values

BUSCH INJ. PUMP TEST SPECIFICATIONS Pump designation : PE6P12OA72ORS167 Governor design. : RQ225/1:00FA323 Governer no. : 0 421 80: 055 TEST BENCH REQUIREMENTS Overflow valve Inlet press., bar: 1.50 Test nozzle holder Opening Orifice plate Test Lines Outside diameter x Wall thickness x Length mm (A) Injection pump setting values BEGINNING OF DELIVERY Test pressure, bar: 25...27 Prestroke mm : 2.00...2.10 : (1.95...2.15) Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4 : 0-60-120-180-240-300 Phasing Tolerance + - 0 : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 1100 Rack travel in mm : 11.10...11.20 Del.quantity cm3/: 17.0...17.2 100 s: (16.7...17.5) cm3 : 0.5Spread 100 s: (0.9) 2nd speed rpm : 225.0 Rack travel in mm : 7.5...7.7 Del.quantity cm3/ : 1.7...2.3 100 s: (1.4...2.6) cm3 : 0.8Spread 100 s: (1.2) GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 550 Rack travel in mm : 15.20...16.40 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 1100 Speed : 170.0...172.0 Del.quantity 1000 : (167.0...175.0) : 5.00 cm3 Spread : (9.00) 1000 RATED SPEED 1st version Setting point: Speed rpm Rack travel in mm : 15.8 Testing: 1st rack travel in: 10.10 Speed rpm : 1145...1160 2nd rack travel in: 4.00 rpm : 1195...1225 Speed 4th rack travel in: 1350

: 0.00...1.00 Speed rom

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 225 Rack travel in mm : 7.6

Testing:

Speed : 100 rpm Minimum rack trave: 9.10
Speed rpm : 225
Rack travel in mm : 7.50...7.70
Rack travel in mm : 2.00
Speed rpm : 365...405

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 11.10...11.20
2nd speed rpm : 550
Rack travel in m: 11.10...130

#### BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 10.10

rpm : 1145...1160 Speed

STARTING FUEL DELIVERY

Speed : 100 rpm

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : FIA 13,8 c Edition : 10.02.89 Replaces : 6.85 Test oil : ISO-4113 Combination no. : 0 401 846 409 Injection pump Pump designation : PE6P120A720RS214 EP type number : 0 411 826 060 Governor : RQV425...1050PA438 Governor design. : 0 421 813 273 Governer no. Customer-spec. information Customer : IVECO-UNIC Engine : 8215.22.520 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly Openina : 207...210 pressure, bar Orifice plate diameter mm : 0,8 Test Lines : 1 680 750 067 Outside diameter x Wall thickness x Length mm : 6.00x1.50x1000 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 25...27

: 2.00...2.10

Rack travel in mm : 9.00...12.00

: (1.95...2.15)

Phasing : 0-60-120-180-240-300 Tolerance + - 0 : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 1050 Rack travel in mm : 10.10...10.20 Del.guantity cm3/: 16.7...16.9 100 s: (16.4...17.2) cm3 : 0.5 Spread 100 s: (0.9) rpm : 425.0 2nd speed Rack travel in mm : 6.2...6.4 Del.quantity cm3/ : 2.5...3.1 100 s: (2.2...3.4) Spread cm3 : 0.8100 s: (1.2) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 425 1.20...1.40 travel mm 600 2nd speed rpm : 3.80...4.60 travel mm 3rd speed rpm : 900 : 6.40...6.70 travel mm rpm : 1050 4th speed : 7.60...7.80 travel mm rpm : 1400 5th speed : 11.00...12.00 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1115 Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 1050 Speed : 167.0...169.0 Del.quantity 1000 : (164.0...172.0) : 5.00 Spread cm3 : (9.00) 1000

Firing order

: 1-5-3-6-2-4

Prestroke mm

# RATED SPEED

1st version Control lever

position degrees: 54...62

Testing:

1st rack travel in: 9.10 Speed rpm : 1090...1100

2nd rack travel in: 4.00

Speed rpm : 1190...1220

4th rack travel in: 1300

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 8...16

Testing:

Speed rpm : 100 Minimum rack trave: 7.80 Speed rpm : 425

Rack travel in mm : 6.20...6.40

CONSTANT REGULATION

Speed rpm : 425...525

## **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 9.10

Speed rpm : 1090...1100

INTERMEDIATE RATED SPEED Rack travel in mm : 4.00

STARTING FUEL DELIVERY

Speed rpm: 100

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

#### Note remarks

Test sheet : SCA 8,0 e 1 Edition : 09.03.87 Replaces : 7.84 Test oil : ISO-4113

: 0 401 846 423 Combination no.

Injection pump

Pump designation : PE6P110A720RS393 : 0 411 816 131 EP type number

Governor

Governor design. : RQV250...1200PA469

: 0 421 813 226 Governer no.

Customer-spec. information Customer : SCANIA

Engine : DN8 01

## TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

: 1 680 750 015 Test lines

Outside diameter

x Wall thickness

: 6.00X1.50X600 x Lenath mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10

: (2.95...3.15)

Rack travel in mm : 9.00...12.00 Firing order

: 1-5- 3- 6- 2-

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

#### BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 12.00...12.10

Del.quantity cm3/: 8.7...8.9

100 s: (8.5...9.1)

cm3 : 0.5Spread

100 s: (0.7)

rpm : 225.0 2nd speed Rack travel in mm: 6.9...7.1 Del.quantity cm3/: 1.1...1.5

100 s: (-) cm3 : 0.2

Spread 100 s: (0.4)

# (B) Setting of injection pump with governor

# GUIDE SLEEVE TRAVEL

1st speed rpm : 200

: 0.70...0.90 travel mm

2nd speed rpm : 500

travel mm : 3.00...3.50 3rd speed rpm : 800

travel mm

: 5.10...5.30

1200 4th speed rpm

: 8.20...8.40 travel mm

## GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1200 Speed

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 600 Speed

: 87.0...89.0 Del.quantity

1000 : (85.0...91.0)

cm3 : 5.00 Spread 1000 : (7.00)

### RATED SPEED

1st version

Control Lever

position degrees: 47...55

Testing:

1st rack travel in: 11.00

: 1240...1250 Speed man

2nd rack travel in: 4.00

: 1325...1355 Speed rpm

4th rack travel in: 1450

rpm : 0.00...1.00Speed

LOW IDLE 1

Control lever

position degrees: 9...17

Testing:

Speed : 100 rpm

Minimum rack trave: 8.40

Speed rpm : 225

Rack travel in mm : 6.90...7.10

Rack travel in mm : 2.00

: 335...395 Speed rom

FUEL DELIVERY CHARACTERISTICS

1st version

: 1200 Speed rpm

Del.quantity cm3/: 98.5...103.5 1000 s: (96.0...106.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.00

rpm : 1240...1250 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 140.0...190.0

1000 s: (-)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 225 Rack travel in mm : 6.90...7.10

Del.quantity cm3/: 11.0...15.0 Spread cm3 : 2.00

1000 s: (4.00)

Remarks:

Delivery-valve spring pre-tension = 2.40...2.60 mm.

G02

Permissible alteration from 2.20...2.90

ADDITIONAL INFORMATION

Check and set without ROBO diaphragam

For comb. with letter index see VDT-I-400/116.

For sealing see VDT-I-400/117.

Scania test specifications taken over on Aug. 22, 1983

Start of delivery - engine: 22° before

Firing sequence of engine:

1-5-3-6-2-4.

Note remarks

: SCA 8,0 e : 09.03.87 Test sheet Edition Replaces : 7.84 Test oil : ISO-4113

Combination no. : 0 401 846 424

Injection pump

Pump designation : PE6P110A720RS393 EP type number : 0 411 816 131

Governor

Governor design. : RQV200...1200PA467

: 0 421 813 224 Governer no.

Customer-spec. information Customer : SCANIA

Engine : DN8 01

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening |

: 172...175 pressure, bar

: 1 680 750 015 Test lines

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.00...3.10 : (2.95...3.15) Prestroke mm

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rom : 6001st speed

Rack travel in mm : 12.00...12.10

Del.quantity cm3/: 8.7...8.9

100 s: (8.5...9.1)

Spread cm3 : 0.5

100 s: (0.7)

2nd speed rpm : 225.0 Rack travel in mm: 6.9...7.1

Del.quantity cm3/ : 1.1...1.5 100 s: (-)

cm3 : 0.2Spread 100 s: (0.4)

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm : 1200

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 600 Speed

: 87.0...89.0 Del.quantity

1000 : (85.0...91.0) cm3 : 5.00

Spread

1000 : (7.00)

RATED SPEED

1st version

Control lever

position degrees: 57...65

Testing:

1st rack travel in: 11.00 Speed rpm : 1240...1250 2nd rack travel in: 4.00

rpm : 1365...1395 Speed

4th rack travel in: 1500

rpm : 0.00...1.00Speed

LOW IDLE 1

Control lever

position degrees: 12...20

Testing:

Speed : 100 rpm Minimum rack trave: 8.40

Speed rpm: 225
Rack travel in mm: 6.90...7.10
Rack travel in mm: 2.00

: 440...500 Speed rpm

FUEL DELIVERY CHARACTERISTICS

1st version

Speed : 1200 rpm

Del.quantity cm3/: 98.5...103.5 1000 s: (96.0...106.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.00

rpm : 1240...1250 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 140.0...190.0

1000 s: (-)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 225
Rack travel in mm : 6.90...7.10
Del.quantity cm3/ : 11.0...15.0
Spread cm3 : 2.00
1000 s: (4.00)

Remarks:

Delivery-valve spring pre-tension =

2.40...2.60 mm.

Permissible alteration from 2.20...2.90

ADDITIONAL INFORMATION

Check and set without ROBO diaphragam

For comb. with letter index see

VDT-I-400/116.

For sealing see VDT-I-400/117.

Scania test specifications taken over on Aug. 22, 1983

Start of delivery - engine: 22° before

TDC

Firing sequence of engine:

1-5-3-6-2-4.

G04

Note remarks

: SCA 8,0 n 1 : 09.03.87 Test sheet Edition

: 7.84 Replaces Test oil : ISO-4113

: 0 401 846 479 Combination no.

Injection pump

Pump designation : PE6P110A720RS393 : 0 411 816 131

EP type number

Governor

Governor design. : RQ750PA528 : 0 421 801 126 Governer no.

Customer-spec. information Customer : SCANIA

: DN8 01 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.00...3.10 Prestroke mm

: (2.95...3.15)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-Firing order

: 0-60-120-180-240-300 Phasina

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 12.00...12.10

Del.quantity cm3/: 9.0...9.2

100 s: (8.8...9.4)

cm3 : 0.5Spread

100 s: (0.7)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm 700

Del.quantity 90.0...92.0 1000 : (88.0...94.0)

: 5.00 Spread cm3

: (7.00) 1000

RATED SPEED

1st version

Testing:

1st rack travel in: 11.60

rpm : 750...755 Speed

2nd rack travel in: 4.00

rpm : 778...788 Speed

4th rack travel in: 1500

rpm : 0.00...1.00Speed

LOW IDLE 1

Testing:

Speed rpm

Rack travel in mm : 2.00

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.60

rpm : 750...755 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 140.0...190.0 Rack travel in mm : 20.00...21.00

Remarks:

ADDITIONAL INFORMATION

Check and set without ROBO diaphragam

For comb. with letter index see VDT-I-400/116.

For sealing see VDT-I-400/117.

Scania test specifications taken over on Aug. 22, 1983

Start of delivery - engine: 22° before

Firing sequence of engine: 1-5-3-6-2-4.

**APPLICATION** 

Generator

Note remarks

: BET 8,8 b 1 : 10.02.89 Test sheet Edition : 12.2.88 Replaces : ISO-4113 Test oil

: 0 401 846 489 Combination no.

Injection pump

Pump designation : PE6P120A320RS377 EP type number : 0 411 826 108

Governor

Governor design. : RQV275...1200PA425-2

: 0 421 813 403 Governer no.

Customer-spec. information Customer : RVI

Engine : MIDS 062030

: 158.1 1st version kW Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 019

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.80...2.90 Prestroke mm : (2.75...2.95)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-

2- 4

: 0-60-120-180-240-300 Phasing

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1200

Rack travel in mm : 12.60...12.70

Del.quantity cm3/: 15.0...15.2

100 s: (14.7...15.5)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 275.0 2nd speed

Rack travel in mm : 5.4...5.6 Del.quantity cm3/ : 1.1...1.7 100 s: (0.8...2.0)

cm3 : 0.8 Spread

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rom : : 1.00...1.20 travel mm

2nd speed : 425 rpm

: 3.00...3.50 travel mm

: 900 3rd speed rpm : 5.60...5.90 travel mm

: 1200 4th speed rpm

: 7.60...7.70 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm : 1275 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1200 Speed

Aneroid pressure h: 700

Del.quantity : 150.0...155.0)

: 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control Lever position degrees: 60...68 Testina: 1st rack travel in: 11.60 Speed rpm : 1245...1255 2nd rack travel in: 4.00 rpm : 1375...1405 Speed 4th rack travel in: 1500 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 6...14 Testina: Speed rpm : 200 Minimum rack trave: 8.10 Speed rom Rack travel in mm : 5.40...5.60 CONSTANT REGULATION rpm : 275...375 Speed Aneroid/Altitude Compensator Test 1st version Setting rpm : 500 hPa : 700 Speed rpm Pressure : 12.60...12.70 Rack travel mm Measurement 1/min : 500 Speed 1st pressure hPa : -Rack travel in m: 11.50...11.60 2nd pressure hPa : 190
Rack travel in m: 12.20...12.30
3rd pressure hPa : 170
Rack travel in m: 11.70...11.90 START CUT-OUT 1/min: 195 (215) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: -

rpm : 500

Del.quantity cm3/: 76.0...78.0 1000 s: (73.0...81.0) BREAKAWAY 1st version 1mm rack travel less than

full load rack tr: -1.00 Speed rpm : 1245...1255

STARTING FUEL DELIVERY

Speed rpm : 100

LOW IDLE

Speed rpm : 275
Rack travel in mm : -7.00...-7.20
Del.quantity cm3/ : 11.0...17.0
1000 s: (8.0...20.0)
Spread cm3 : 8.00

Spread cm3 : 8.00 1000 s: (12.00)

Remarks:

**APPLICATION** 

Omnibus

**GD8** 

Speed

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : VOL 7,1 a 1 : 10.02.89 Test sheet Edition : 12.9.86 Replaces : ISO-4113 Test oil Combination no. : 0 401 846 506 Injection pump Pump designation : PE6P110A320RS483-1 EP type number : 0 411 816 160 Governor Governor design. : RQV250...1200PA499-2 : D 421 813 461 Governer no. Customer-spec. information Customer : VOLVO Engine : TD71FS : 180.0 1st version kW Rated speed : 2400 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder assembly : 0 681 343 009 Openina pressure, bar : 172...175 Test lines : 1 680 750 015 Outside diameter x Wall thickness x Length mm : 6.00x1.50x600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

: 1-5-3-6-2-4 Firing order : 0-60-120-180-240-300 Phasina Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING rpm: 700 1st speed Rack travel in mm : 13.10...13.20 Del.quantity cm3/: 14.2...14.4 100 s: (13.9...14.7) Spread cm3 : 0.4100 s: (0.7) rpm : 250.02nd speed Rack travel in mm: 5.3...5.5 Del.quantity cm3/: 1.6...2.0 100 s: (-) cm3 : 0.3Spread 100 s: (0.6) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 250 1st speed : 1.20...1.30 travel mm 2nd speed : 300 man 1.70...2.00 travel mm 400 3rd speed rpm : 2.50...2.80 travel mm : 700 4th speed rpm travel mm : 4.40...4.70 : 1200 5th speed rpm : 7.60...7.80 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1300 Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 700 Speed Aneroid pressure h: 900 Del.quantity : 142.0...147.0)

BEGINNING OF DELIVERY

Prestroke mm

Test pressure, bar: 25...27

Rack travel in mm : 9.00...12.00

: 3.00...3.10

: (2.95...3.15)

Spread cm3 : 4.00 1000 : (7.50)RATED SPEED 1st version Control lever position degrees: 58...66 Testing: 1st rack travel in: 12.10 Speed rpm : 1240...1250 2nd rack travel in: 4.00 Speed rpm : 1385...1415 4th rack travel in: 1500 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 5...13 Testing: Speed rpm : 100 Minimum rack trave: 6.80 rpm : 250 Speed Rack travel in mm : 5.30...5.50 CONSTANT REGULATION Speed rpm : 300...410 Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 rpm hPa : 900 Pressure : 13.10...13.20 Rack travel mm Measurement 1/min : 500 Speed 1st pressure hPa :-Rack travel in m: 10.20...10.30 2nd pressure hPa : 700 Rack travel in m: 12.90...13.00 3rd pressure hPa : 300 Rack travel in m: 10.60...10.80 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 900

Speed rpm : 1000 Del.quantity cm3/ : 134.0...138.0

Aneroid pressure h: -

rom

1000 s: (131.0...141.0)

: 700

Del.quantity cm3/: 85.0...88.0 1000 s: (82.0...91.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 12.10 Speed rpm : 1240...1250 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 170.0...200.0 1000 s: (-) Rack travel in mm : 20.00...21.00 LOW IDLE Speed rpm : 250
Rack travel in mm : 5.30...5.50
Del.quantity cm3/ : 16.0...20.0
Spread cm3 : 3.00 1000 s: (6.00) Remarks: Delivery-valve spring pre-tension = 2.40...2.60 mm. Permissible alteration from 2.20...2.90

Speed

Note remarks

Test sheet : ENA 10,1 b Edition : 07.02.89 : 25.3.88 Replaces Test oil : ISO-4113

Combination no. : 0 401 846 546

Injection pump

Pump designation : PE6P100A820LS130 EP type number : 0 411 806 179

Governor

Governor design. : RQV250...1050PA807-1

Governer no. : D 421 813 665

Customer-spec. information Customer : ENASA

: 95 A1 BX Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00X1.50X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.80...2.90 Prestroke mm : (2.75...2.95)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1030 1st speed

Rack travel in mm : 11.70...11.80

Del.quantity cm3/: 11.4...11.6

100 s: (11.2...11.8)

cm3 : 0.3Spread

100 s: (0.6)

2nd speed rpm : 250.0 Rack travel in mm : 7.9...8.1 Del.quantity cm3/ : 1.8...2.2

100 s: (1.5...2.4)

cm3 : 0.3 Spread 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250

: 0.90...1.30 travel mm rpm : 350 2nd speed

travel mm

: 1.60...2.20 : 700 3rd speed rpm

: 4.40...5.00 travel mm 1095 4th speed rpm

: 7.90...8.10 travel mm

: 1185 5th speed rpm

travel mm : 8.80...9.20

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 1120

Speed Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

: 1030 Speed rpm

: 114.0...116.0 Del.guantity 1000 : (112.0...118.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version Control lever position degrees: 41...49 Testing: 1st rack travel in: 10.70 Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1170...1200
4th rack travel in: 1300
Speed rpm : 0.00...1.00 LOW IDLE 1 Control lever position degrees: 12...20 Testing: Speed : 100 rpm Minimum rack trave: 7.50 Speed rpm : 250 Rack travel in mm : 5.90...6.10 CONSTANT REGULATION rpm : 250...400 Speed START CUT-OUT 1/min: 170 (150) Speed BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 10.70 rpm : 1090...1100 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 260.0...280.0 1000 s: (256.0...284.0) Rack travel in mm : 19.50...21.00 LOW IDLE Speed rpm : 250 Rack travel in mm : 5.90...6.10 Remarks:

APPLICATION

Special-purpose vehicle

Note remarks

Test sheet : ENA 11,9 a1 : 24.02.89 Edition : 19.5.88 Replaces

Test oil : ISO-4113

: 0 401 846 550 Combination no.

Injection pump

Pump designation : PE6P120A320RS257 : 0 411 826 075 EP type number

Governor

Governor design. : RQV250...1050PA808

: 0 421 813 553 Governer no.

Customer-spec. information Customer : ENASA

: 96 T1 CX Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

: 0,8 diameter mm

: 1 680 750 067 Test lines

Outside diameter x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90

: (2.75...2.95) Rack travel in mm : 9.00...12.00

G13

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1030 1st speed

Rack travel in mm : 10.90...11.00

Del.quantity cm3/: 20.9...21.1

100 s: (20.6...21.4)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 250.0 2nd speed Rack travel in mm : 5.6...5.8 Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.6)

Spread cm3 : 0.8100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL 1st speed

rpm : 250 : 1.00...1.40 travel mm

rpm : 350 2nd speed

: 1.70...2.30 travel mm

3rd speed rpm : 700

travel mm : 4.50...5.10

1095 4th speed rpm

: 8.20...8.40 travel mm

rpm : 1175 5th speed

: 9.10...9.50 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1090 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1030

Aneroid pressure h: 900

Del.quantity : 207.0...214.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 48...56

Testing:

1st rack travel in: 9.90

Speed rpm : 1090...1100 2nd rack travel in: 4.00

rpm : 1160...1190 Speed

4th rack travel in: 1300

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 13...21

Testing:

: 100 Speed rpm Minimum rack trave: 7.20 : 250 rpm

Rack travel in mm : 5.60...5.80

CONSTANT REGULATION

rpm : 250...370 Speed

Aneroid/Altitude Compensator Test

1st version Setting

Speed : 500 rpm hPa : 900 Pressure

Rack travel mm : 10.90...11.00

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 8.30...8.70

2nd pressure hPa : 510

Rack travel in m: 10.40...10.50

3rd pressure hPa : 300

Rack travel in m: 9.20...9.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

rpm\_ : 650

Del.quantity cm3/: 187.0...193.0 1000 s: (184.0...196.0)

Aneroid pressure h: -

Speed rpm

Del.quantity cm3/: 119.0...121.0 1000 s: (116.0...124.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 9.90

rpm : 1090...1100 Speed

STARTING FUEL DELIVERY

rpm : 100

Det.quantity cm3/: 140.0...160.0 1000 s: (136.0...164.0)

Rack travel in mm : 19.50...21.00

Remarks:

Check electrically unlatched starting

fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,

the start position must be reached.

**APPLICATION** 

Special-purpose vehicle

Note remarks

: SCA 11.0 y : 21.05.87 Test sheet Edition Replaces : 9.3.87 Test oil : ISO-4113

Combination no. : 0 401 846 764

Injection pump

Pump designation : PE6P110A720RS3115 EP type number : 0 411 816 735

Governor

Governor design. : RQV200...1100PA468

: D 421 813 364 Governer no.

Customer-spec. information

: SAAB-SCANIA Customer

Engine : DN11 01

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening |

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.30...3.40

: (3.25...3.45)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 600 1st speed

Rack travel in mm : 12.40...12.50

Del.quantity cm3/: 11.9...12.1

100 s: (11.7...12.3)

cm3 : 0.5 Spread

100 s: (0.7)

rpm : 225.0 2nd speed

Rack travel in mm : 5.4...5.6 Del.quantity cm3/ : 2.0...2.4 100 s: (-)

cm3 : 0.2 Spread

100 s: (0.4)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed 225 rom : travel mm

0.90...1.00

: 360 : 2.60...2.90 2nd speed rpm : travel mm

: 560 3rd speed rpm

: 4.30...4.60 travel mm

: 1150 4th speed rpm : 8.40...8.60 travel mm

5th speed : 1250 rpm

travel mm : 9.50...9.80

GUIDE SLEEVE POSITION

Control-Lever position

Degree: -1 rpm : 1150

Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed : 600 rpm

Del.quantity

: 119.0...121.0 1000 : (117.0...123.0)

5.00 cm3

: (7.00)1000

RATED SPEED

Spread

1st version Control lever

position degrees: 57...65

Testing:

1st rack travel in: 11.40

rpm : 1140...1150 Speed

2nd rack travel in: 4.00

rpm : 1250...1280 Speed

4th rack travel in: 1400

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 6...14

Testing:

Speed rpm : 100 Minimum rack trave: 6.90

Speed rpm : 225
Rack travel in mm : 5.40...5.60
Rack travel in mm : 2.00

: 330...390 Speed rpm

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1100 Del.quantity cm3/ : 119.5...124.5 1000 s: (118.0...126.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.40

rpm : 1140...1150 Speed

INTERMEDIATE RATED SPEED

Rack travel in mm: 4.00

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 240.0...290.0 1000 s: (-) Rack travel in mm: 20.00...21.00

LOW IDLE

Speed rpm : 225

Rack travel in mm : 5.40...5.60 Del.quantity cm3/ : 20.0...24.0

cm3 : 2.00

Spread

1000 s: (4.00)

Remarks:

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

ADDITIONAL INFORMATION

Check and set without ROBO diaphragam

For comb. with letter index see VDT-I-400/116.

For sealing see VDT-I-400/117.

Scania test specifications taken over

on April 10, 1984

Start of delivery - engine: 21° before

Firing sequence of engine:

1-5-3-6-2-4.

Prestroke mm : 4.50...4.60 : (4.45...4.65) Rack travel in mm : 9.00...12.00 Firing order : 1-4-2-6-3-5 BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : PER 12,2 c : 07.02.89 Test sheet Edition Replaces : ISO-4113 Test oil Phasing Combination no. : 0 402 046 797 Tolerance + - 0 Time to cyl. no. : 1 Injection pump Pump designation : PES6P120A320RS3212 EP type number : 0 412 026 731 BASIC SETTING Governor Governor design. : RQV250..1050PA794-2 1st speed : 0 421 813 698 Governer no. Customer-spec. information : PERKINS Customer Engine : EAGLE TX : 240.0 1st version kW Spread : 2100 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve Spread : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder assembly : 1 688 901 019 1st speed travel mm Openina : 207...210 pressure, bar 2nd speed travel mm Orifice plate 3rd speed diameter mm : 0,8 travel mm 4th speed travel mm : 1 680 750 067 Test lines 5th speed travel mm Outside diameter x Wall thickness : 6.00X1.50X1000 x Length mm (A) Injection pump setting values Speed Insp. values in parentheses

Rack travel in mm : 14.60...14.70 Del.quantity cm3/: 23.9...24.1 100 s: (23.6...24.4) cm3 : 0.6100 s: (0.9) 2nd speed rpm : 250.0 Rack travel in mm : 5.9...6.1 Del.quantity cm3/: 1.3...1.7 100 s: (1.0...2.0) cm3 : 0.3100 s: (0.6) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 250 : 0.90...1.30 rpm : 350 : 2.90...3.50 rpm : 700 : 4.00...4.60 : 1000 rpm 7.40...7.60 : 1100 rpm : 8.80...9.20 GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1070 Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 900 Aneroid pressure h: 1200

: 0-60-120-180-240-300

: 0.50 (0.75)

rpm: 900

BEGINNING OF DELIVERY

per values \_

Test pressure, bar: 25...27

Set equal delivery quant.

Del.quantity : 239.0...241.0 1000 : (236.0...244.0)

: 6.00 Spread cm3 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 50...58

Testing:

1st rack travel in: 13.60 Speed rpm : 980...990 2nd rack travel in: 4.00 rpm : 1085...1115 Speed

4th rack travel in: 1250

rpm : 0.00...1.00Speed

LOW IDLE 1 Control lever

position degrees: 16...24

Testing:

Speed rpm : 100 Minimum rack trave: 7.50 rpm : 250 Speed

Rack travel in mm : 5.90...6.10

CONSTANT REGULATION

rpm : 250...550 Speed

Aneroid/Altitude Compensator Test

1st version Setting

Speed : 500 rpm hPa : 1200 Pressure

: 14.60...14.70 Rack travel mm

Measurement

1/min : 500 Speed

1st pressure hPa : -

Rack travel in m: 12.20...12.30

2nd pressure hPa : 900

Rack travel in m: 14.10...14.20

3rd pressure hPa : 510

Rack travel in m: 12.60...12.80

START CUT-OUT

1/min : 170 (190) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

G18

Aneroid pressure h: 1200

Speed rpm : 600 Del.quantity cm3/ : 243.0...249.0

1000 s: (240.0...252.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.60

rpm : 980...990 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 130.0...170.0 1000 s: (-)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 250 Rack travel in mm : 5.90...6.10

Remarks:

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring preload on new delivery-valve holders to 2.9...3.1 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : UNI 9,5 a 2 : 07.02.89 Test sheet Edition Replaces : 30.9.88 : ISO-4113 Test oil : 0 402 046 800 Combination no. Injection pump Pump designation : PES6P110A720RS3140 EP type number : 0 412 016 716 Governor Governor design. : RQV275...1100PA501-6 Governer no. : 0 421 813 711 Customer-spec. information : IVECO-UNIC Customer : 8460.21.202/206 Engine : 176.0 1st version kW Rated speed : 2200 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 0 681 343 009 assembly Opening 1997 pressure, bar : 172...175 Test Lines : 1 680 750 015 Outside diameter x Wall thickness x Length mm : 6.00x1.50x600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

Phasing : 0-60-120-180-240-300 Tolerance + - 0 : 0.50 (0.75) BASIC SETTING 1st speed rpm: 1100 Rack travel in mm : 11.30...11.40 Del.guantity cm3/: 13.9...14.2 100 s: (13.6...14.4) cm3 : 0.4Spread 100 s: (0.7) rpm : 275.0 2nd speed Rack travel in mm : 6.8...7.0 Del.quantity cm3/: 2.2...2.7 100 s: (1.9...2.9) Spread cm3 : 0.4100 s: (0.7) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 250 travel mm : 1.00...1.20 2nd speed rpm : 400 travel mm : 2.70...3.00 rpm : 850 3rd speed 5.00...5.20 travel mm 1100 4th speed rpm : 6.80...7.00 travel mm : 1500 5th speed rpm : 11.00...12.00 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1260 Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1100 Aneroid pressure h: 700 Del.quantity : 139.0...142.0 1000 : (136.5...144.5) Spread cm3 : 4.00 1000 : (7.50)

: 1-5-3-6-2-4

Firing order

G19

BEGINNING OF DELIVERY

Prestroke mm

Test pressure, bar: 25...27

Rack travel in mm : 9.00...12.00

: 3.20...3.30

: (3,15...3.35)

RATED SPEED

1st version Control Lever

position degrees: 59...67

Testing:

1st rack travel in: 10.30

rpm : 1140...1150 Speed

2nd rack travel in: 4.00

Speed rpm : 1245...1275 4th rack travel in: 1400

rpm : 0.00...1.00Speed

LOW IDLE 1

Control lever

position degrees: 11...19

Testina:

Speed : 100 rom

Minimum rack trave: 8.40

rpm : 275 Speed

Rack travel in mm : 6.80...7.00

CONSTANT REGULATION

rpm : 280...525 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed rpm

hPa : 700 Pressure

Rack travel mm : 11.30...11.40

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 9.90...10.10

2nd pressure hPa : 280 Rack travel in m: 10.80...10.90

3rd pressure hPa : 260

Rack travel in m: 10.30...10.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/: 104.0...107.0

1000 s: (101.5...109.5)

**BREAKAWAY** 

1st version

G20

1mm rack travel less than

full load rack tr: 10.30

rpm : 1140...1150 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 140.0...170.0 1000 s: (136.0...174.0)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks

Test sheet : MB 11,7 a12 Edition : 04.11.88 Replaces

Test oil : ISO-4113

Combination no. : 0 402 046 802

Injection pump

Pump designation : PES6P110A820LS3131-1

: 0 412 016 717 EP type number

Governor

Governor design. : RQ300/1100PA722-2

Governer no. : 0 421 801 459

Customer-spec. information

Customer : DAIMLER-BENZ

Engine : OM447

1st version kW : 177.0 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00X1.50X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.30...4.40 Prestroke mm : (4.25...4.45)

Rack travel in mm : 9.00...12.00

: 6-2-4-1-5-3 Firing order

: 0-60-120-180-240-300 Phasina

Tolerance  $+ - \circ : 0.50 (0.75)$ 

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 11.00...11.10

Del.quantity cm3/: 13.9...14.1

100 s: (13.6...14.3)

cm3 : 0.4Spread

100 s: (0.8)

2nd speed rpm : 300.0 Rack travel in mm : 7.2...7.4 Del.quantity cm3/ : 1.4...2.0

100 s: (1.1...2.3) cm3 : 0.4

Spread 100 s: (0.8)

GUIDE SLEEVE POSITION Control-lever position Degree: -1

Speed rpm: 600 Rack travel in mm: 13.00...14.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1100 Speed

: 139.0...141.0 Del.quantity 1000 : (136.5...143.5)

: 4.00 cm3 Spread

1000 : (8.00)

RATED SPEED

1st version

Setting point:

Speed rpm Rack travel in mm : 13.5

Testing:

1st rack travel in: 10.00 Speed rpm : 1140...1150

2nd rack travel in: 4.00

rpm : 1185...1215 Speed

4th rack travel in: 1250

Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300 Rack travel in mm : 7.3

Testing:

Speed : 100 rpm Minimum rack trave: 8.80

Speed rpm : 300 Rack travel in mm : 7.20...7.40

Rack travel in mm : 2.00

Speed rpm : 380...420

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600 Del.quantity cm3/ : 116.0...119.0 1000 s: (113.0...122.0)

cm3 : 5.00Spread 1000 s: (9.00)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 10.00

Speed rpm : 1140...1150

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 130.0...150.0 1000 s: (126.0...154.0)

Remarks:

Adjust full-load delivery by turning temperature-dependent excess-fuel stop

for starting (TAS).

Note remarks

Test sheet : RVI 14,9 f1 Edition : 07.02.89 Replaces : 10.4.87 Test oil : ISO-4113

: 0 402 048 046 Combination no.

Injection pump

Pump designation : PES8P120A320RS507 : 0 412 028 023 EP type number

Governor

Governor design. : RQV275...1050PA665-2 Governer no. : 0 421 813 623

Customer-spec. information Customer : RVI

: MIVR083530 Engine

: 268.0 1st version kW Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 075

Outside diameter x Wall thickness

: 6.00X1.50X1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.80...2.90 : (2.75...2.95) Prestroke mm

Rack travel in mm : 9.00...12.00 : 1-8-4-2-7- 3-Firing order

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm: 1050 1st speed

Rack travel in mm : 11.00...11.10

Del.quantity cm3/: 18.2...18.4

100 s: (17.9...18.7)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 275.02nd speed Rack travel in mm : 5.2...5.4 Del.quantity cm3/: 1.9...2.5 100 s: (1.6...2.8)

cm3 : 0.8 Spread 100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 275 travel mm

: 0.60...1.00 450 2nd speed rpm

3.20...3.60 travel mm

550 3rd speed rpm

4.10...4.50 travel mm 4th speed rpm

: 5.00...5.40 : 1050 travel mm

5th speed rpm

: 7.50...7.70 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1130

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050 Aneroid pressure h: 700

Del.quantity : 182.0...07.0 1000 : (179.0...187.0) cm3 : 5.00 Spread : (9.00) 1000 RATED SPEED

1st version Control lever

position degrees: 49...57

Testing:

1st rack travel in: 10.00 Speed rpm : 1105...1115 2nd rack travel in: 4.00

rpm : 1195...1225 Speed

4th rack travel in: 1350

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 16...24

Testina:

Speed : 200 rpm Minimum rack trave: 7.40 : 275 rpm

Rack travel in mm : 5.60...5.80

CONSTANT REGULATION

rpm : 300...430 Speed

Aneroid/Altitude Compensator Test

1st version Setting

: 500 Speed rpm hPa : 700 Pressure

: 11.00...11.10 Rack travel mm

Measurement

 $1/\min : 500$ Speed

1st pressure hPa : -

Rack travel in m: 9.40...9.60

2nd pressure hPa : 150

Rack travel in m: 10.60...10.70

3rd pressure hPa : 110

Rack travel in m: 9.80...10.00

START CUT-OUT

1/min: 195 (215) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

**G24** 

Aneroid pressure h: 700

Speed rpm : 650

Del.quantity cm3/: 165.0...171.0 1000 s: (162.0...174.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/ : 116.0...118.0 1000 s: (113.0...121.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: -1.00

rpm : 1105...1115 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 140.0...160.0 1000 s: (136.0...164.0)

LOW IDLE

rpm : 275 Speed

Rack travel in mm : -5.20...-5.40

Del.quantity cm3/: 19.0...25.0 1000 s: (16.0...28.0)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

Start-of-delivery mark 13° cam angle

after start of delivery cyl. 1.

Note remarks

: IHC 9,4 a 4 : 7.2.89 Test sheet

Edition Replaces

Test oil : ISO-4113

Combination no. : 0 402 058 043

Injection pump

Pump designation : PES8P100A921/5RS286

Governor

Governor design. : RQV300...1300PA443KR

Customer-spec. information Customer : THC

Engine : DVT 800

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 40...45

Overflow valve

: 1 417 413 040

Inlet press., bar: 2.70

Test nozzle holder

: 1 688 901 017 assembly

Openina |

: 207...210 pressure, bar

Orifice plate

diameter mm : 0.6

Test lines : 9 681 230 713

Outside diameter

x Wall thickness

: 1/4"x0.083"x40" x Length mm

(A) Injection pump setting values Insp. Values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

: 2.70...2.80 Prestroke mm

: (2.65...2.85)

Rack travel in mm: 10.50

: 1-8-4-2-7-3-6-5 Firing order

: 0-45-90-135-180-225-Phasing

270-315

: 0.50 (0.75) Tolerance + - 0

Time to cyl. no. : 1

BASIC SETTING

rpm: 1300 1st speed

Rack travel in mm : 12.20...12.30

Del.quantity cm3/: 13.8...14.0

100 s: (-)

cm3 : 0.4Spread

100 s: (-)

rpm : 300 2nd speed Rack travel in mm : 5.00 Del.quantity cm3/: 1.6...2.0

100 s: (-) cm3 : 0.5 Spread

100 s: (-)

GUIDE SLEEVE POSITION Control-Lever position

Degree: -1

rpm : 1320 Speed Rack travel in mm : 15.00...17.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1300 Speed

Aneroid pressure h: 800 : 138.0...140.0 Del.quantity

1000 : (-)

: 4.0 Cm3 Spread 1000 : (-)

RATED SPEED

1st version

Control lever

position degrees: 60.5...65.5

Testing:

1st rack travel in: 11.20 Speed rpm : 1340...1350

2nd rack travel in: 4.00

rpm : 1450...1480 Speed

4th rack travel in: 1640

: 0.00...1.00 Speed rom

LOW IDLE 1 Control Lever

position degrees: 8.5...13.5 Testing: : 100 Speed rpm Minimum rack trave: 6.20 : 300 Speed rpm Rack travel in mm: 5.00...5.20 Rack travel in mm: 2.00 Speed rpm: 425...485 TORQUE CONTROL Dimension a mm : ? Torque control curve - 1st version 1st speed rpm : 1300 Rack travel in m: 12.15...12.25 2nd speed rpm : 900 Rack travel in m: 11.70...11.80 3rd speed rpm : 700 Rack travel in m: 11.20...11.30 Aneroid/Altitude Compensator Test 1st version Setting Speed : 800 rpm hPa : 160 Pressure : +0.50 Rack travel mm Measurement 1/min: 800 Speed 1st pressure hPa : 620 Rack travel in m: 11.60...11.80 START CUT-OUT 1/min: 170...230 Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 800 : 900 Speed rpm Del.quantity cm3/: 132.0...138.0 1000 s: (-) Spread cm3 1000 s: (-) Aneroid pressure h: -

Speed rpm : 800 Del.quantity cm3/ : 89.0...97.0 1000 s: (-)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.20 rpm : 1340...1350 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 188.0...228.0 1000 s: (-)

LOW IDLE

Speed rpm : 300 Del.quantity cm3/ : 16.0...20.0 1000 s: (-)

Remarks: Start-of-delivery mark is at start of delivery of cylinder 1

Note remarks

Test sheet : MB 10,0 n Edition : 07.02.89

Replaces

Test oil : ISO-4113

Combination no. : 0 402 075 700

Injection pump

Pump designation : PES5P110A720LS3221

EP type number

: 0 412 015 701

Governor

Governor design. : RSV350...1100P0A487-

Governer no. : 0 421 833 314

Customer-spec. information

Customer : DAIMLER-BENZ

: 0M449 Engine

: 140.0 1st version kW Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 4.30...4.40 : (4.25...4.45)

Rack travel in mm : 9.00...12.00 Firing order : 1-3-5-4-2

Phasing

: 0-72-144-216-288

Tolerance + - 0

: 0.50 (0.75)

Time to cyl. no. : 5

BASIC SETTING

1st speed

rpm: 1080

Rack travel in mm : 10.80...10.90

Del.guantity cm3/: 13.5...13.7

100 s: (13.2...13.9)

Spread

Spread

cm3 : 0.4

100 s: (0.8)

rpm : 350.0 2nd speed

Rack travel in mm : 6.3...6.7 Del.quantity cm3/: 1.2...1.8

100 s: (0.9...2.0)

cm3 : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800

Rack travel in mm : 0.30...0.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1080 Speed

: 135.0...137.0 Del.quantity

1000 : (132.5...139.5)

: 4.00 Spread cm3

1000 : (8.00)

RATED SPEED

1st version

Control Lever

position degrees: 40...48

Testing:

1st rack travel in: 9.80

rpm : 1130...1140 Speed

2nd rack travel in: 4.00

rpm : 1190...1220 Speed 4th rack travel in: 1250 rpm : 0.30...1.40 Speed LOW IDLE 1 Control lever position degrees: 16...24 Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 6.5
Speed rpm : 350
Rack travel in mm : 6.30...6.70
Rack travel in mm : 2.00

: 470...530 Speed rpm

SET IDLE AUXILIARY SPRING Rack travel in mm : 2.00

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600 Del.quantity cm3/ : 114.0...118.0 1000 s: (111.0...121.0)

Spread cm3 : 6.00 1000 s: (9.00)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 9.80

rpm : 1130...1140 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 140.0...160.0 1000 s: (136.0...164.0)

Remarks:

Note remarks

Test sheet : DEE 7,6 L 2 Edition : 8.2.89

Replaces

Test oil : ISO-4113

Combination no. : 0 402 076 028

Injection pump

Pump designation : PES6P110A720RS305

Governor

Governor design. : RSV400...1050P2/415D

Customer-spec. information

Customer : JOHN DEERE

: 6466 A Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Openina

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Prestroke mm

: 2.75...2.85 : (2.70...2.90)

Rack travel in mm : 11.70

Firing order : 1-5-3-6-2-4

Control lever

Time to cyl. no. : 1

BASIC SETTING

Tolerance + - °

Phasing

1st speed rpm: 1050

Rack travel in mm : 11.70...11.80

Del.guantity cm3/: 16.0...16.2

100 s: (15.8...16.4)

: 0.5 (0.75)

: 0-60-120-180-240-300

cm3 : 0.4Spread

100 s: (-)

2nd speed rpm : 400 Rack travel in mm : 6.20...6.40 Del.quantity cm3/: 1.9...2.5

100 s: (-)

cm3 : 0.4Spread

100 s: (-)

GUIDE SLEEVE POSITION Control-lever position

Degree: 800 rpm : -3 Speed

Rack travel in mm : 0.40...1.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050 Aneroid pressure h: 800

: 160.0...162.0 Del.quantity

1000 : (158.0...164.0)

cm3 Spread

: 4.0 : (-) 1000

RATED SPEED

1st version

Control lever

position degrees: 40...48

Testing:

1st rack travel in: 10.70 Speed rpm : 1095...1105 2nd rack travel in: 6.00

rpm : 1130...1170 Speed

LOW IDLE 1

position degrees: 17...25

Setting point w/out bumper spring rpm : 400 Speed Rack travel in mm : 6.00...6.20

Testing:

Speed rpm : 100 Minimum rack trave: 19.00 rpm : 400 Speed

Rack travel in mm : 6.00...6.20 Rack travel in mm : 2.00

: 570...630 Speed LDW

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1050

2nd speed

Rack travel in m: 11.70...11.80 and speed rpm : 730 Rack travel in m: 11.70...11.80

3rd speed rpm : 650 Rack travel in m: 12.20...12.40

Aneroid/Altitude Compensator Test

1st version

Setting

: 550 Speed rpm hPa : 800 Pressure

Rack travel mm : 11.70...11.80

Measurement

1/min: 550 Speed

1st pressure hPa : 175 \*

START CUT-OUT

1/min: 350...450 Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 800 : 650 Speed mqn

Del.quantity cm3/: 170.0...174.0 1000 s: (168.0...176.0)

Aneroid pressure h: -: 550 Speed rpm

Del.quantity cm3/: 88.0...96.0 1000 s: (86.0...98.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 10.70

H02

rpm : 1095...1105 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 130.0 1000 s: (-)

HIGH IDLE

1st version

Speed : 1150 rpm

Del.quantity cm3/: 47.0...57.0 1000 s: (-)

LOW IDLE

Speed rpm : 400 Del.quantity cm3/ : 19.0...25.0 1000 s: (-)

Remarks:

\* Start of LDA (manifold-pressure

compensator) movement

Note remarks

: DEE 7,6 y 1 Test sheet : 20.12.88 Edition Replaces : 30.9.88 : ISO-4113 Test oil

Combination no. : 0 402 076 722

Injection pump

Pump designation : PES6P120A720RS3203

EP type number : 0 412 026 728

Governor

Governor design. : RSV400...1100P2A534

Governer no. : 0 421 833 275

Customer-spec. information

: JOHN DEERE Customer

Engine : 6466 HF-050

: 194.0 1st version kW : 2200 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Opening |

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00x3.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 3.55...3.65

: (3.50...3.70)

Rack travel in mm : 10.50

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1100 1st speed

Rack travel in mm : 12.00...12.10

Del.quantity cm3/: 15.6...15.8

100 s: (15.4...16.1)

Spread cm3 : 0.4

100 s: (0.7)

rpm : 400.0 2nd speed Rack travel in mm : 4.8...5.0

Del.quantity cm3/: 1.7...2.2 100 s: (1.5...2.5)

Spread

cm3 : 0.4 100 s: (0.7)

GUIDE SLEEVE POSITION Control-lever position

Dearee: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1100 Speed Aneroid pressure h: 1200

Del.quantity : 750.5....161.0)

Spread cm3 : 4.00

1000 : (7.50)

RATED SPEED

1st version Control lever

position degrees: 40...48

Testing:

1st rack travel in: 11.00 Speed rpm : 1145...1155 2nd rack travel in: 4.00 Speed rpm : 1200...1210 4th rack travel in: 1300 rpm : 0.30...1.40Speed LOW IDLE 1 Control Lever

position degrees: 16...24 Setting point w/out bumper spring rpm : 400 Speed Rack travel in mm: 4.4

Testing:

Speed rpm : 100 Minimum rack trave: 19.00 : 400 Speed rpm

Rack travel in mm : 4.80...5.00

Rack travel in mm : 2.00 : 540...600 Speed rom

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 12.00...12.10 2nd speed rpm : 750

Rack travel in m: 12.80...13.00

Aneroid/Altitude Compensator Test

1st version Setting

: 500 Speed rpm Pressure hPa : -

: 10.30...10.50 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : 605 Rack travel in m: 11.00...11.10 2nd pressure hPa : 780

Rack travel in m: 12.10...12.50 3rd pressure hPa : 1200

Rack travel in m: 12.80...13.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200 Speed rpm : 750 Del.quantity cm3/ : 174.5...179.5 1000 s: (172.0...182.0)

Aneroid pressure h: -

Speed : 800 rpm

Del.quantity cm3/: 117.5...121.5 1000 s: (114.5...124.5)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.00

Speed rpm : 1145...1155

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 90.0...110.0 1000 s: (85.0...115.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 400

Rack travel in mm : 4.80...5.00 Del.quantity cm3/: 17.5...22.5 1000 s: (15.0...25.0)

cm3 : 4.50 1000 s: (7.50) Spread

Remarks:

: JOHN DEERE # RE32035

Adjustment without torque-control spring retainer with 0,5 mm less control-rod travel. Increase in full-load delivery with torque-control spring retainer.

Starting/full-load transition speed from holding magnet = 450 1/min.

Start-of-delivery mark 10.5° cam angle after start of delivery cyl. 1

Note remarks

Test sheet : DEE 7,6 y Edition : 20.12.88 Replaces : 30.9.88 Test oil : ISO-4113

Combination no. : 0 402 076 723

Injection pump

Pump designation : PES6P120A720RS3203

EP type number : 0 412 026 728

Governor

: RSV400...1100P2A534-Governor design.

Governer no. : 0 421 833 276

Customer-spec. information Customer : JOHN DEERE

: 6466 AF-050 Engine

: 180.0 1st version kW : 2200 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

: 1 680 750 015 Test lines

Outside diameter x Wall thickness

: 6.00X3.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

H05

: 3.55...3.65 Prestroke mm : (3.50...3.70)

Rack travel in mm : 10.50

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1100 1st speed

Rack travel in mm : 11.80...11.90

Del.guantity cm3/: 15.0...15.2

100 s: (14.7...15.4)

Spread cm3 : 0.4

100 s: (0.7)

rpm : 400.02nd speed Rack travel in mm : 4.8...5.0 Del.quantity cm3/: 1.7...2.2 100 s: (1.5...2.5)

cm3 : 0.4Spread

100 s: (0.7)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Rack travel in mm: 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100
Aneroid pressure h: 1200
Del.quantity : 150.0...152.0

1000 : (147.5...154.5)

: 4.00 cm3

Spread 1000 : (7.50)

RATED SPEED

1st version

Control lever

position degrees: 40...48

Testina: 1st rack travel in: 10.80 rpm : 1145...1155 Speed 2nd rack travel in: 4.00 rpm : 1200...1210 Speed 4th rack travel in: 1350 rom : 0.30...1.40Speed LOW IDLE 1 Control lever position degrees: 16...24 Setting point w/out bumper spring rom : 400 Rack travel in mm: 4.4 Testina: Speed rpm : 100 Minimum rack trave: 19.00 rpm : 400 Speed Rack travel in mm: 4.80...5.00 Rack travel in mm: 2.00 : 540...600 Speed rpm TORQUE CONTROL Torque control curve - 1st version rpm : 1100 1st speed Rack travel in m: 11.80...11.90 2nd speed rpm : 700 Rack travel in m: 12.60...12.80 Aneroid/Altitude Compensator Test 1st version Settina : 500 Speed rpm Pressure hPa : 1200 Rack travel mm : 12.60...12.80 Measurement 1/min: 500 Speed 1st pressure hPa : -Rack travel in m: 10.40...10.60 2nd pressure hPa : 720 Rack travel in m: 11.00...11.10 3rd pressure hPa : 895 Rack travel in m: 11.80...12.20 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 Speed rpm : 700 Del.quantity cm3/: 173.5...178.5

1000 s: (171.0...181.0)

: 800

Del.quantity cm3/: 120.0...124.0 1000 s: (117.0...127.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.80 rpm : 1145...1155 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 90.0...110.0 1000 s: (85.0...115.0) Rack travel in mm: 20.00...21.00 LOW IDLE rpm : 400 Speed Rack travel in mm : 4.80...5.00 Del.quantity cm3/: 17.5...22.5 1000 s: (15.0...25.0) cm3 : 4.50 1000 s: (7.50) Spread Remarks: : JOHN DEERE # RE32033 Adjustment without torque-control spring retainer with 0,5 mm less control-rod travel. Increase in full-load delivery with torque-control spring retainer. Starting/full-load transition speed from holding magnet = 450 1/min. Start-of-delivery mark 10.5° cam angle after start of delivery cyl. 1

Speed

Aneroid pressure h: -

rpm

Note remarks

: MB 11,7 d 2 Test sheet : 07.02.89 Edition : 7.3.88 Replaces Test oil : ISO-4113

Combination no. : 0 402 076 725

Injection pump

Pump designation : PES6P110A820LS3131-1

EP type number : 0 412 016 717

Governor

Governor design. : RSV350..1050P0A487-5

: 0 421 833 285 Governer no.

Customer-spec. information

Customer : DAIMLER-BENZ

: OM447 Engine

: 177.0 1st version kW : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

: 1 680 750 015 Test lines

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.30...4,40 Prestroke mm : (4.25...4.45)

Rack travel in mm : 9.00...12.00

: 6-2-4-1-5-3 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

rpm : 1030 1st speed

Rack travel in mm : 12.50...12.60

Del.quantity cm3/: 15.0...15.2

100 s: (14.7...15.4)

cm3 : 0.4Spread

100 s: (0.8)

2nd speed rpm : 350.0 Rack travel in mm : 7.0...7.3 Del.quantity cm3/: 1.4...2.0

100 s: (1.1...2.3)

cm3 : 0.4Spread 100 s: (0.7)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

Speed rpm: 800 Rack travel in mm: 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1030 Speed

Del.quantity : 150.0...152.0 1000 : (147.5...154.5)

: 4.00 cm3 Spread

1000 : (8.00)

RATED SPEED

1st version

Control lever

position degrees: 43...51

Testing:

1st rack travel in: 11.50

H07

```
rpm : 1075...1085
  Speed
2nd rack travel in: 4.00
              rpm : 1130...1160
  Speed
4th rack travel in: 1350
  Speed
              rpm : 0.00...1.40
LOW IDLE 1
Control lever
 position degrees: 20...28
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 7.1
Testing:
                   : 100
Speed
              rpm
Minimum rack trave: 19.50
Speed rpm : 350
Rack travel in mm : 7.00...7.30
Rack travel in mm : 2.00
                   : 400...440
Speed
              rpm
SET IDLE AUXILIARY SPRING
Rack travel in mm: 2.00
FUEL DELIVERY CHARACTERISTICS
1st version
Speed
                    : 600
              rpm
Del.quantity cm3/: 133.0...137.0
1000 s: (130.0...140.0)
              cm3 : 6.00
Spread
              1000 s: (9.00)
BREAKAWAY
1st version
1mm rack travel less than
 full load rack tr: 11.50
             rpm : 1075...1085
Speed
STARTING FUEL DELIVERY
             rpm : 100
Speed
Del.quantity cm3/: 130.0...150.0
             1000 s: (126.0...154.0)
LOW IDLE
Speed rpm : 350
Rack travel in mm : 7.00...7.30
Del.quantity cm3/ : 14.0...20.0
              1000 s: (11.0...23.0)
Spread
              cm3 : 4.50
             1000 s: (7.00)
Remarks:
```

H08

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : DEE 7,7 b : 20.12.88 : 30.9.88 Edition Replaces Test oil : ISO-4113 Combination no. : 0 402 076 727 Injection pump : 0 412 026 728 EP type number Governor Governor design. : 0 421 833 290 Governer no. Customer-spec. information Customer : JOHN DEERE : 6076AF Engine : 160.0 1st version kW : 2200 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 457 413 010 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 101 assembly Opening : 207...210 pressure, bar Orifice plate diameter mm : 0,6 Test lines : 1 680 750 015 Outside diameter x Wall thickness x Length mm : 6.00x3.00x600 (A) Injection pump setting values

Test pressure, bar: 27...29

H09

Pump designation : PES6P120A720RS3203 : RSV400...1100P2A534-Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY

Prestroke mm : 3.55...3.65 : (3.50...3.70)
Rack travel in mm : 10.50 Firing order : 1-5-3-6-2-4 Phasing : 0-60-120-180-240-300 Tolerance + - 0 : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING rpm: 1100 1st speed Rack travel in mm : 11.10...11.20 Del.guantity cm3/: 13.4...13.6 100 s: (13.1...13.8) Spread cm3 : 0.4100 s: (0.7) rpm : 400.02nd speed Rack travel in mm : 4.8...5.0 Del.quantity cm3/: 1.7...2.2 100 s: (1.5...2.5) cm3 : 0.4Spread 100 s: (0.7) GUIDE SLEEVE POSITION Control-lever position Degree: -3 rpm : 800 Rack travel in mm : 0.30...0.70 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 1100 Speed Aneroid pressure h: 900 Del.quantity : 1.54.u...130... 1000 : (131.5...138.5) Spread cm3 : 4.00 : (7.50) 1000 RATED SPEED 1st version Control lever

position degrees: 40...48

Testing:

1st rack travel in: 10.10 rpm : 1145...1155 Speed

2nd rack travel in: 4.00

rpm : 1200...1210 Speed

4th rack travel in: 1300

: 0.30...1.40 Speed rpm

LOW IDLE 1 Control lever

position degrees: 16...24

Setting point w/out bumper spring

: 400 rpm Rack travel in mm: 4.4

Testing:

Speed : 100 rpm Minimum rack trave: 19.00 Speed : 400 rpm

Rack travel in mm : 4.80...5.00 Rack travel in mm : 2.00

Speed : 540...600 rpm

TORQUE CONTROL

Torque control curve - 1st version 1st speed rpm : 1100 Rack travel in m: 11.10...11.20

rpm : 700 2nd speed

Rack travel in m: 12.40...12.60

Aneroid/Altitude Compensator Test

1st version

Settina

Speed : 500 rpm hPa : Pressure

: 10.50...10.70 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : 470

Rack travel in m: 11.20...11.30

2nd pressure hPa : 605

Rack travel in m: 11.80...12.20 3rd pressure hPa : 900

Rack travel in m: 12.40...12.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900 Speed : 700

man Del.quantity cm3/: 165.5...170.5

1000 s: (163.0...173.0)

Aneroid pressure h: -

Speed rpm : 800

Del.quantity cm3/: 122.0...126.0 1000 s: (121.0...131.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.10

rpm : 1145...1155 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 90.0...110.0

1000 s: (85.0...115.0) Rack travel in mm: 20.00...21.00

LOW IDLE

: 400 Speed rpm

Rack travel in mm : 4.80...5.00 Del.quantity cm3/: 17.5...22.5 1000 s: (15.0...25.0)

Spread cm3 : 4.50

1000 s: (7.50)

Remarks:

: JOHN DEERE # RE32034

Adjustment without torque-control spring retainer with 0,5 mm less control-rod travel. Increase in full-load delivery with torque-control spring retainer.

Starting/full-load transition speed from holding magnet = 450 1/min.

Start-of-delivery mark 10.5° cam angle after start of delivery cyl. 1

Note remarks

: DEE 7,7 c : 20.12.88 : 30.9.88 Test sheet Edition Replaces Test oil : ISO-4113

: 0 402 076 728 Combination no.

Injection pump

Pump designation : PES6P120A720R\$3203 : 0 412 026 728 EP type number

Governor

: RSV425...1050P2A489-Governor design.

: 0 421 833 291 Governer no.

Customer-spec. information

: JOHN DEERE Customer

Engine : 6076 HRW01

: 175.0 1st version kW Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

**Opening** 

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test Lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00x3.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 3.55...3.65 : (3.50...3.70) Rack travel in mm : 10.50

Firing order

: 1-5-3-6-2-4

Phasing

: 0-60-120-180-240-300

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1050 1st speed

Rack travel in mm : 12.20...12.30

Del.quantity cm3/: 16.0...16.2

100 s: (15.7...16.4)

Spread cm3 : 0.4

100 s: (0.7)

rpm : 425.0 2nd speed

Rack travel in mm : 4.8...5.0 Del.quantity cm3/: 1.7...2.2

100 s: (1.5...2.5)

cm3 : 0.4Spread

100 s: (0.7)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1050 Speed Aneroid pressure h: 1200

Del.quantity : 160.0...162.0

1000 : (157.5...164.5)

cm3 : 4.00 Spread

1000 : (7.50)

RATED SPEED

1st version Control lever

position degrees: 40...48

H11

Testina: 1st rack travel in: 11.20 rpm : 1090...1100 Speed 2nd rack travel in: 4.00 Speed rpm : 1160...1170 4th rack travel in: 1250 rpm : 0.30...1.40Speed LOW IDLE 1 Control lever position degrees: 16...24 Setting point w/out bumper spring : 425 rpm Rack travel in mm : 4.4 Testing: Speed : 100 rpm Minimum rack trave: 19.00 rpm : 425 Rack travel in mm : 4.80...5.00 Rack travel in mm : 2.00 : 570...630 Speed rpm TORQUE CONTROL Torque control curve - 1st version st speed rpm : 1050 Rack travel in m: 12.20...12.30 1st speed : 600 2nd speed rpm Rack travel in m: 13.40...13.60 Aneroid/Altitude Compensator Test 1st version Setting rpm : 500 hPa : 1200 mm : 13.40...13.60 Speed rom Pressure Rack travel mm Measurement Speed 1/min: 500 1st pressure hPa : -Rack travel in m: 12.10...12.30 2nd pressure hPa : 725 Rack travel in m: 12.50...12.60 3rd pressure hPa : 815 Rack travel in m: 12.90...13.30 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 : 600 Speed rpm Del.quantity cm3/: 191.0...196.0

1000 s: (188.5...198.5)

: 800

Del.quantity cm3/: 157.0...161.0 1000 s: (154.0...164.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 11.20 rpm : 1090...1100 Speed STARTING FUEL DELIVERY rpm : 100 Del.quantity cm3/: 90.0...110.0 1000 s: (85.0...115.0) Rack travel in mm : 20.00...21.00 LOW IDLE Speed rpm : 425 Rack travel in mm : 4.80...5.00 Del.quantity cm3/: 17.5...22.5 1000 s: (15.0...25.0) cm3 : 4.50 1000 s: (7.50) Spread

Remarks:

: JOHN DEERE # RE32888

Adjustment without torque-control spring retainer with 0,5 mm less control-rod travel. Increase in full-load delivery with torque-control spring retainer.

Starting/full-load transition speed from holding magnet = 450 1/min.

Start-of-delivery mark 10.5° cam angle after start of delivery cyl. 1

H12

Speed

Aneroid pressure h: -

rom

Note remarks

: DEE 10,1 g1 Test sheet : 20.12.88 Edition Replaces : 30.9.88 Test oil : ISO-4113

Combination no. : 0 402 076 731

Injection pump

Pump designation : PES6P110A720RS3217

: 0 412 016 724 EP type number

Governor

: RSV400...1050P2A534-Governor design.

: 0 421 833 305 Governer no.

Customer-spec. information

Customer : JOHN DEERE

Engine : 6101 H

1st version kW : 224.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

: 172...175 pressure, bar

Test Lines : 1 680 750 015

**Cutside** diameter

x Wall thickness

x Length mm : 6.00X3.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

: 3.45...3.55 Prestroke mm

: (3.40...3.60)

Rack travel in mm : 10.50

: 1-5-3-6-2-4 Firing order

Phasing

: 0-60-120-180-240-300

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 12.90...13.00

Del.quantity cm3/: 21.2...21.4

100 s: (20.9...21.6)

cm3 : 0.4Spread

100 s: (0.7)

2nd speed rpm : 400.0 Rack travel in mm : 5.2...5.4 Del.quantity cm3/ : 2.0...2.5

100 s: (1.8...2.8)

Spread cm3 : 0.4100 s: (0.7)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

Speed rpm: 800 Rack travel in mm: 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1050 Speed Aneroid pressure h: 1200

: 212.0...214.0 Del.quantity 1000 : (209.5...216.5)

: 4.00 cm3 Spread

: (7.50) 1000

RATED SPEED

1st version Control lever

position degrees: 36...44

Testing:

1st rack travel in: 11.90

rpm : 1090...1100 Speed

H13

2nd rack travel in: 4.00 rpm : 1145...1155 Speed 4th rack travel in: 1300 Speed rpm : 0.30...1.40

LOW IDLE 1 Control lever

position degrees: 14...22
Setting point w/out bumper spring

: 400 rpm Rack travel in mm: 4.8

Testing:

Speed rpm : 100 Minimum rack trave: 19.00 : 400 rom

Rack travel in mm : 5.20...5.40

Rack travel in mm : 2.00 : 560...620 Speed rpm

TORQUE CONTROL

Torque control curve - 1st version 1st speed rpm : 1050 Rack travel in m: 12.90...13.00

: 700 2nd speed rpm

Rack travel in m: 13.70...13.90

Aneroid/Altitude Compensator Test

1st version Setting

Speed : 500 rpm Pressure hPa : 1200

: 13.70...13.90 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 10.90...11.10
2nd pressure hPa : 325
Rack travel in m: 11.60...11.70
3rd pressure hPa : 640

Rack travel in m: 12.90...13.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 700 Del.quantity cm3/ : 228.0...233.0 1000 s: (225.5...235.5)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/ : 160.0...164.0

1000 s; (157.0...167.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.90 peed rpm : 1090...1100

Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 165.0...185.0 1000 s: (160.0...190.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 5.20...5.40
Del.quantity cm3/ : 20.5...25.5
1000 s: (18.0...28.0)

cm3 : 4.50Spread 1000 s: (7.50)

Remarks:

: JOHN DEERE # RE36881

Adjustment without torque-control spring retainer with 0.5 mm less control—rod travel. Increase in full—load delivery with torque—control spring retainer.

Starting/full-load transition speed from holding magnet = 450 1/min.

Start-of-delivery mark 10.5° cam angle after start of delivery cyl. 1

Note remarks

: MB 11,7 d 3 : 07.02.89 Test sheet Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 402 076 732

Injection pump

Pump designation : PES6P110A820LS3131-1

: 0 412 016 717 EP type number

Governor

Governor design. : RSV350..1100P0A487-6

: 0 421 833 311 Governer no.

Customer-spec. information

Customer : DAIMLER-BENZ

: OM447 Engine

1st version kW : 177.0 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

pressure, bar : 172...175

: 1 680 750 015 Test lines

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.30...4.40 : (4.25...4.45)

Rack travel in mm : 9.00...12.00

: 6-2-4-1-5-3 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

rpm: 1080 1st speed

Rack travel in mm : 11.70...11.80

Del.guantity cm3/: 14.4...14.6

100 s: (14.1...14.8)

Spread cm3 : 0.4

100 s: (0.8)

2nd speed rpm : 350.0 Rack travel in mm : 7.0...7.3 Del.quantity cm3/ : 1.4...2.0 100 s: (1.1...2.3)

cm3 : 0.4Spread

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3 rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1080

: 144.0...146.0 Del.quantity 1000 : (141.5...148.5)

Spread cm3 : 4.00

1000 : (8.00)

RATED SPEED

1st version

Control lever

position degrees: 43...51

Testing:

1st rack travel in: 10.70

: 1130...1140 Speed rpm 2nd rack travel in: 4.00 rpm : 1190...1220 Speed 4th rack travel in: 1350 rpm : 0.00...1.40Speed LOW IDLE 1 Control lever position degrees: 20...28 Setting point w/out bumper spring Speed rpm: 350 Rack travel in mm: 7.1 Testing: rpm : 100 Speed Minimum rack trave: 19.50 Speed rpm: 350
Rack travel in mm: 7.00...7.30
Rack travel in mm; 2.00 : 400...440 Speed rpm SET IDLE AUXILIARY SPRING Rack travel in mm : 2.00 FUEL DELIVERY CHARACTERISTICS 1st version : 600 Speed rpm Del.quantity cm3/: 124.0...128.0 1000 s: (121.0...131.0) cm3 : 6.00 Spread 1000 s: (9.00) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.70 rpm : 1130...1140 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 130.0...150.0 1000 s: (126.0...154.0) LOW IDLE Speed rpm : 350 Rack travel in mm : 7.00...7.30 Del.quantity cm3/: 14.0...20.0 1000 s: (11.0...23.0) cm3 : 4.50 Spread 1000 s: (7.00) Remarks:

H16

Note remarks

Test sheet

: MTU 26,5 b2 : 9.2.89

Edition

Replaces

Test oil

: ISO-4113

Combination no.

: 0 402 438 028

Injection pump

Pump designation : PE8ZW160/120RS1027

111

EP type number

: 0 402 468 006

Governor

Governor design. : RQUV300...900ZWA67

: 0 422 409 037 Governer no.

Customer—spec. information Customer

: MTU

kW

Engine

: 8V 331

1st version

: 452.0

Rated speed

: 1800

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 40...45

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 443 022 assembly

**Opening** 

pressure, bar

: 172...175

Test Lines

: 1 680 750 016

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.00x1500

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Prestroke mm

: 2.50...2.60

: (2.45...2.65)

Rack travel in mm: 18.00

H17

Firing order : 8-1-2-6-3-4-5-7

Phasing

: 0-45-90-135-180-225-

270-315

Tolerance + - 0

: 0.50 (0.75)

BASIC SETTING

1st speed

rpm: 900

Rack travel in mm : 10.00

Del.guantity cm3/: 23.0...24.0

100 s: (22.7...24.3

Spread

Spread

cm3 : 1.2

100 s: (1.8)

2nd speed rpm : 600
Rack travel in mm : 10.00
Del.quantity cm3/ : 19.0...21.0
100 s: (18.5...21.5)
Spread cm3 : 1.5
100 s: (2.2)

3rd speed rpm : 300

Rack travel in mm : 9.00

Del.quantity cm3/ : 7.2...9.2

100 s: (6.7...9.7) cm3 : 1.0

100 s: (1.5)

GUIDE SLEEVE POSITION

Control-Lever position

Degree: -1 rpm : 900

Rack travel in mm : 18.00...18.10

RATED SPEED

1st version

Control lever

position degrees: 75...83

Testing:

1st rack travel in: 17.00 Speed rpm : 905...925

2nd rack travel in: 4.00

: 1000...1050 Speed rpm

4th rack travel in: 1100

Speed rpm : 0.00...2.00

SET IDLE CONTROL LEVER

POSITION

Speed rpm

Rack travel in mm: 8.00

Control lever

position degrees: 18...24

LOW IDLE 1

Control lever

position degrees: 18...24

Testing:

Speed rpm : 200 Minimum rack trave: 10.80 Speed rpm : 400

Speed rpm : 400
Rack travel in mm : 3.90...5.00
Rack travel in mm : <0.01
Speed rpm : 485...590

LOW IDLE 2 Control lever

position degrees: 24...30 Setting point w/out bumper spring

Speed rpm : 375 Rack travel in mm : 8.00

Testing:

Speed rpm: 200

Rack travel in mm : 14.3...17.2

Speed rpm: 300

Rack travel in mm: 10.3...11.8

Speed rpm : 500

Rack travel in mm: 1.9...3.7

## **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 17.00 Speed rpm : 905...925

## Remarks:

Full-load delivery is set on engine according to engine test report.

Note remarks

Test sheet : PER 16,3 a : 07.02.89 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 402 638 804

Injection pump

Pump designation : PE8P12OA12ORS7167

EP type number : 0 412 628 834

Governor

Governor design. : RQV300...1050PA908

Governer no. : 0 421 813 734

Customer-spec. information Customer : PERKINS

: cv8 Engine

1st version kW : 485.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 019

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60 : (4.45...4.65)

Rack travel in mm : 9.00...12.00

1-3-6-5-4-8-7-2 Firing order

: 0-45-90-135-180-225-270-315 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no.

BASIC SETTING

1st speed rpm: 900

Rack travel in mm : 13.10...13.20

Del.guantity cm3/: 31.0...31.2

100 s: (30.6...31.6)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 300.02nd speed Rack travel in mm : 5.0...5.4 Del.quantity cm3/ : 2.2...2.8 100 s: (1.9...3.1)

cm3 : 0.8 Spread 100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed

travel mm : 1.10...1.50

2nd speed rpm : 500 travel mm

3.40...3.80 800

3rd speed rpm

travel mm 5.10...5.50

1060 4th speed rpm

: 7.70...7.90 : 1185 travel mm 5th speed rpm

travel mm : 9.10...9.50

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1100

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 900 Speed

Aneroid pressure h: 1200

Del.quantity : 310.0...316.0)

: 5.00 Spread cm3 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 51...59

Testing:

1st rack travel in: 12.10

rpm : 1055...1065 Speed

2nd rack travel in: 4.00

Speed rpm : 1160...1190 4th rack travel in: 1300

rpm : 0.00...1.00Speed

LOW IDLE 1 Control lever

position degrees: 18...26

Testing:

Speed : 100 rpm Minimum rack trave: 6.70

Speed rpm : 300 Rack travel in mm : 5.00...5.40

CONSTANT REGULATION

rpm : 300...500 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 500 rpm hPa : 1200 Pressure

: 13.10...13.20 Rack travel mm

Measurement

1/min : 500Speed

1st pressure hPa :-

Rack travel in m: 11.10...11.30
2nd pressure hPa : 850
Rack travel in m: 12.60...12.70
3rd pressure hPa : 700

Rack travel in m: 11.70...11.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 600 Del.quantity cm3/: 317.0...323.0

1000 s: (314.0...326.0)

Aneroid pressure h: -

Speed rpm : 600 Del.quantity cm3/ : 238.0...242.0 1000 s: (236.0...244.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 12.10

rpm : 1055...1065 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Rack travel in mm : 20.00...21.00

Remarks:

Delivery-valve spring pre-tension 3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring preload on new delivery-valve holders

to 2.9...3.1 mm.

**APPLICATION** 

Navy

Note remarks

: MAN 21,0 a : 10.2.89 Test sheet Edition Replaces : 1.7.88

: ISO-4113 Test oil

Combination no. : 0 402 640 811

Injection pump

: PE12P12OA520LS7812 : 0 412 620 807 Pump designation

EP type number

Governor

Governor design. : RQV250...1150PA860-1 Governer no. : 0 421 813 692

Customer-spec. information Customer : MAN

Engine : D2842LYE

: 735.0 1st version kW : 2300 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

: 6.00X1.50X1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.90...5.00 Prestroke mm

: (4.85...5.05)
Rack travel in mm : 9.00...12.00 12-1-5-9-8-Firing order

- 4- 11- 10- 2- 6- 7

: 0-45-60-105-120-165-Phasina 180-225-240-285-300-

: 345 Phasing

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

1st speed rpm: 1150

Rack travel in mm : 13.20...13.30

Del.quantity cm3/: 28.9...29.1

100 s: (28.6...29.4)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 250 2nd speed

Rack travel in mm : 7.30...7.50 Del.quantity cm3/ : 5.2...6.0 \*

100 s: (-) rpm : 500

3rd speed Rack travel in mm : < 7.50 Del.quantity cm3/: - \*\* 100 s: (-)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350 : 2.00...2.40 travel mm

: 900 2nd speed rpm

: 6.70...7.10 travel mm

3rd speed : 1150 rpm

: 8.50...8.60 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1150 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150 Aneroid pressure h: 1300

: 289.0...291.0 Del.quantity 1000 : (286.0...294.0) : 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 63...71 Testing: 1st rack travel in: 12.20 rpm : 1190...1200 Speed 2nd rack travel in: 4.00 rpm : 1345...1375 4th rack travel in: 1500 rpm : 0.00...1.00Speed LOW IDLE 1 Control Lever position degrees: 8..16 Testing: Speed : 100 rpm Minimum rack trave: 8.90 : 250 Speed rpm Rack travel in mm : 7.30...7.50 Rack travel in mm : 2.00 Speed : 405...465 rpm Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 rpm hPa : 1300 Pressure Rack travel mm : 13.20...13.30 Measurement  $1/\min : 500$ Speed 1st pressure hPa : -Rack travel in m: 8.80...9.00 2nd pressure hPa : 270 Rack travel in m: 9.20...9.30 3rd pressure hPa : 790 Rack travel in m: 11.40...11.80 START CUT-OUT 1/min: 170 (190) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: -

H22

: 500 Speed rpm Del.quantity cm3/: 146.0...148.0 1000 s: (143.0...151.0) Spread cm3 : 8.001000 s: (12.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 12.20 rpm : 1190...1200 Speed STARTING FUEL DELIVERY : 100 Speed rpm Del.quantity cm3/: 100.0...120.0 \* 1000 s: (-) LOW IDLE Speed rpm : 500Rack travel in mm : <8.00 Del.quantity cm3/: <50.0 1000 s: (-) Remarks:

\* applies to cylinders 4, 5, 6, 8, 10 and 12 \*\* applies for cylinders 1, 2, 3, 7, 9 and 11

Note remarks

Test sheet : MAN 21,0 a1 : 07.02.89 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 402 640 813

Injection pump

Pump designation : PE12P12OA52OLS7812

EP type number : 0 412 620 807

Governor

Governor design. : RQV250...1150PA902-1

: 0 421 813 728 Governer no.

Customer-spec. information Customer : MAN

: D2842LYE Engine

1st version kW : 735.0 : 2300 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 019

Opening 1

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

: 6.00x1.50x1000 x Lenath mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.90...5.00 : (4.85...5.05)

Rack travel in mm : 9.00...12.00

: 12- 1- 5- 9- 8- 3-Firing order

4- 11- 10- 2- 6- 7

: 0-45-60-105-120-165-180-225-240-285-300-Phasing

: 345 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

1st speed rpm: 1150

Rack travel in mm : 13.20...13.30

Del.quantity cm3/: 28.9...29.1

100 s: (28.6...29.4)

cm3 : 0.5Spread

100 s: (0.9)

100 s: (-) rpm : 500 3rd speed Rack travel in mm : <7.50 Del.quantity cm3/: - \*\* 100 s: (-)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250

: 1.10...1.50 travel mm

rpm : 500 2nd speed

: 3.80...4.20 travel mm

rpm : 850 3rd speed

travel mm : 8.50...8.90

rpm : 1150 4th speed

: 9.50...9.70 travel mm

rpm : 1400 5th speed

: 13.00...14.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 1200 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version Speed rpm : 1150 1st version Aneroid pressure h: 1600 Del.quantity : 289.0...291.0 Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 149.0...151.0 1000 : (286.0...294.0) Spread cm3 : 5.00 1000 s: (146.0...154.0) 1000 : (9.00) Spread cm3 : 8.001000 s: (12.0) RATED SPEED 1st version **BREAKAWAY** Control lever position degrees: 57...65 1st version 1mm rack travel less than Testing: 1st rack travel in: 12.20 full load rack tr: 12.20 rpm : 1190...1200 rpm : 1190...1200 Speed Speed 2nd rack travel in: 4.00 Speed rpm : 1275...1315 4th rack travel in: 1400 STARTING FUEL DELIVERY rpm : 0.00...1.00Speed : 100 Speed rpm LOW IDLE 1 Del.quantity cm3/: 100.0...120.0 \* Control lever 1000 s: (-) position degrees: 18...26 HIGH IDLE Testing: Speed rpm : 100 1st version Minimum rack trave: 8.90 Speed rpm : 500 rpm : 250 Rack travel in mm : <8.00 Rack travel in mm : 7.30...7.50 Rack travel in mm : 2.00 Del.quantity cm3/: <50.0 1000 s: (-) Speed rpm : 430...490 2nd version Aneroid/Altitude Speed rpm : 500 Compensator Test Rack travel in mm : 8.70 Del.quantity cm3/: 130.0 1000 s: (-) 1st version Setting Remarks: Speed : 500 man : hPa : 1300 Pressure Rack travel mm : 13.20...13.30 \* applies to cylinders 4, 5, 6, 8, 10 \*\* applies for cylinders 1, 2, 3, 7, 9 Measurement and 11 1/min: 500 Speed 1st pressure hPa : -Rack travel in m: 8.90...9.10 APPLICATION 2nd pressure hPa : 500 Ship Rack travel in m: 9.30...9.40 3rd pressure hPa : 1150 Rack travel in m: 11.80...12.20 START CUT-OUT Speed 1/min : 170 (190) FUEL DELIVERY CHARACTERISTICS

H24

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : MAN 21,0 a2 Test sheet Edition : 07.02.89 Replaces Test oil : ISO-4113 : 0 402 640 814 Combination no. Injection pump Pump designation : PE12P120A520LS7812 : 0 412 620 807 EP type number Governor Governor design. : RQV250...1150PA902 Governer no. : 0 421 813 720 Customer-spec. information Customer : MAN Engine : D2842LXE : 662.0 1st version kW : 2300 Rated speed TEST BENCH REQUIREMENTS Test cil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly **Opening** : 207...210 pressure, bar Orifice plate diameter mm : 0,8 : 1 680 750 067 Test lines Outside diameter x Wall thickness x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 25...27 H25

Prestroke mm : 4.90...5.00 : (4.85...5.05) Rack travel in mm : 9.00...12.00 : 12- 1- 5- 9- 8- 3-4- 11- 10- 2- 6- 7 Firing order : 0-45-60-105-120-165-Phasing 180-225-240-285-300-Phasing 345 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 12 BASIC SETTING rpm: 1150 1st speed Rack travel in mm : 12.20...12.30 Del.quantity cm3/: 24.9...25.1 100 s: (24.6...25.4) Spread cm3 : 0.5100 s: (0.9) rpm : 500.0 2nd speed Rack travel in mm : 8.7...8.9 Del.quantity cm3/: 14.1...14.7 100 s: (13.8...15.0) Spread cm3 : 0.8100 s: (1.2) 3rd speed rpm : 250 Rack travel in mm : 7.30...7.50 Del.quantity cm3/ : 5.2...6.0 \* 100 s: (-) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 250 : 1.10...1.50 travel mm 2nd speed rpm : 500 travel mm : 3.80...4.20 : 850 3rd speed mgn travel mm : 8.50...8.90 : 1150 4th speed rom 9.50...9.70 travel mm : 1400 5th speed rpm : 13.00...14.00 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1

rpm : 1200

Rack travel in mm : 15.20...17.80

FUEL DELIVERY CHARACTERISTICS FULL LOAD DELIV. AT FULL LOAD STOP 1st version 1st version Speed rpm : 1150 Aneroid pressure h: -Aneroid pressure h: 1300 rpm\_ : 500 Speed Del.quantity : 249.0...254.0) Del.quantity cm3/: 149.0...151.0 1000 s: (146.0...154.0) : 5.00 cm3 Spread 1000 : (9.00) **BREAKAWAY** RATED SPEED 1st version 1st version 1mm rack travel less than Control lever position degrees: 57...65 full load rack tr: 11.20 Speed rpm : 1190...1200 Testing: 1st rack travel in: 11.20 STARTING FUEL DELIVERY rpm : 1190...1200 Speed 2nd rack travel in: 4.00 Speed rpm : 100 Del.quantity cm3/ : 100.0...120.0 \* 1000 s: (-) 4th rack travel in: 1450 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever HIGH IDLE position degrees: 18...26 1st version : 500\*\* Speed Testing: rom Speed Rack travel in mm : <7.50 : 100 man Del.quantity cm3/: <0 1000 s: (-) Minimum rack trave: 8.90 : 250 rpm Rack travel in mm : 7.30...7.50 Rack travel in mm : 2.00 2nd version Speed rpm : 500\*\*
Rack travel in mm : <8.00
Del.quantity cm3/ : <50.0
1000 s: (-) : 430...490 Speed rpm Aneroid/Altitude Compensator Test 3rd version 1st version Speed rpm : 500 Rack travel in mm: 8.70 Settina Del.quantity cm3/: 125.0 1000 s: (-) : 500 Speed rpm hPa : 1300 Pressure : 12.20...12.30 Rack travel mm LOW IDLE Measurement Speed rpm : 250
Rack travel in mm : 7.30...7.50
Del.quantity cm3/ : 52.0...60.0 \*
1000 s: (-) 1/min: 500 Speed 1st pressure hPa : -Rack travel in m: 8.90...9.10 2nd pressure hPa : 270 Rack travel in m: 9.30...9.40 Remarks: 3rd pressure hPa : 790 Rack travel in m: 11.30...11.70 \* applies to cylinders 4, 5, 6, 8, 10 START CUT-OUT \*\* applies for cylinders 1, 2, 3, 7, 9 1/min : 200 (220) and 11 Speed

APPLICATION Ship

Note remarks

Test sheet : SCA 11,0 v2 Edition : 24.07.87

: 9.3.87 Replaces Test oil : ISO-4113

Combination no. : 0 402 646 804

Injection pump

Pump designation : PE6P12OA72ORS7004

: 0 412 626 801 EP type number

Governor

Governor design. : RQ900PA528 : 0 421 801 127 Governer no.

Customer-spec. information

: SAAB - SCANIA Customer

: DS11 43,44,45 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.00...5.10 Prestroke mm

: (4.95...5.15)

Rack travel in mm : 9.00...12.00

Phasing : 0-60-120-180-240-300

: 1-5-3-6-2-4

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

Firing order

rpm: 850 1st speed

Rack travel in mm : 12.80...12.90

Del.guantity cm3/: 20.7...20.9

100 s: (20.4...21.2)

cm3 : 0.6Spread

100 s: (0.9)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 850 Speed

: 207.0...209.0 Del.quantity 1000 : (204.0...212.0)

: 6.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 22...30

Testina:

1st rack travel in: 11.80

Speed rpm : 900...905 2nd rack travel in: 4.00

rpm : 941...955 Speed

4th rack travel in: 1000

rpm : 0.00...1.00Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 240.0...290.0 1000 s: (-) Rack travel in mm: 20.00...21.00

HIGH IDLE

1st version

Rack travel in mm : 4.90...5.10

**H28** 

Spread

cm3 : 4.00 1000 s: (7.00)

Remarks:

Delivery-valve spring pre-tension 3.2...3.4 mm. Permissible alteration of 3.0...3.5 mm

ADDITIONAL INFORMATION

Check and set without ROBO diaphragam

For comb. with letter index see VDT-I-400/116.

For sealing see VDT-I-400/117.

Scania test specifications taken over on Oct. 17, 1988

Engine model DS 11 - 17° before top dead center.

Engine model DSI 11 - 16° before top dead center.

Firing sequence of engine: 1-5-3-6-2-4.

Note remarks

Test sheet : VOL 16,0 a : 10.02.89 Edition Replaces : 24.7.87 Test oil : ISO-4113

: 0 402 646 832 Combination no.

Injection pump

Pump designation : PE6P130A720RS7122 EP type number : 0 412 636 804

Governor

Governor design. : RQV225...930PA799

: 0 421 813 544 Governer no.

Customer-spec. information Customer : VOLVO

: TD160 Engine

1st version kW : 343.0 : 1860 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 019

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.60...3.70 Prestroke mm

: (3.55...3.75)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - ⁰ : 0.30 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 12.90...13.00

Del.quantity cm3/: 27.4...27.7

100 s: (27.1...28.1)

cm3 : 0.6Spread

100 s: (1.0)

2nd speed rpm : 250.0 Rack travel in mm : 5.0...5.2 Del.quantity cm3/: 2.5...3.0 100 s: (2.3...3.3)

cm3 : 0.5Spread 100 s: (0.8)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250

: 1.00...1.40 travel mm

2nd speed rpm : 350

: 2.10...2.70 travel mm : 700

3rd speed rpm travel mm

: 6.40...6.60 : 960

4th speed rpm

: 7.60...7.80 travel mm

1045 5th speed rpm

travel mm : 9.00...9.40

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1010 Speed

Rack travel in mm : 6.70...9.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700 Aneroid pressure h: 700 Del.quantity : 274.5...277.5 1000 : (271.0...281.0)

: 6.00 Spread cm3 1000 : (10.00)

RATED SPEED

1st version Control lever

position degrees: 57...65

Testing:

1st rack travel in: 11.90 rpm : 960...972 Speed 2nd rack travel in: 4.00 Speed rpm : 1030...1060 4th rack travel in: 1150

rpm : 0.00...1.00Speed

LOW IDLE 1 Control lever

position degrees: 5...13

Testing:

Speed rpm : 100 Minimum rack trave: 6.50 Speed rpm

Rack travel in mm : 5.00...5.20

CONSTANT REGULATION

Speed rpm : 225...400

Aneroid/Altitude Compensator Test

1st version Setting

Speed : 500 rpm hPa : 700 Pressure

: 12.90...13.00 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 9.70...9.80

2nd pressure hPa : 80

Rack travel in m: 10.00...10.10

3rd pressure hPa : 540

Rack travel in m: 12.50...12.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: rpm : 700 Speed

Del.quantity cm3/: 182.5...185.5 1000 s: (179.0...189.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.90 Speed rpm : 960...972

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 125.0...145.0 Rack travel in mm : 9.70...9.80

LOW IDLE

rpm : 250 Speed

Rack travel in mm : 5.00...5.20 Del.quantity cm3/: 25.5...30.5 1000 s: (23.0...33.0)

cm3 : 5.00

1000 s: (8.00)

Remarks:

Spread

Delivery-valve spring pre-tension 3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring preload on new delivery-valve holders to 2.9...3.1 mm.

Note remarks

Test sheet : SCA 11,1 b : 10.02.89 Edition

Replaces

Test oil : ISO-4113

: 0 402 646 836 Combination no.

Injection pump

Pump designation : PE6P120A720RS7126 : 0 412 626 815

EP type number Governor

Governor design. : RQV200...1000PA725-1

: 0 421 813 552 Governer no. -

Customer-spec. information

Customer : SAAB-SCANIA

: DSC11 18 Engine

TEST BENCH REQUIREMENTS

Test oil

: 38...42 inlet temp. °C

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Openina

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Lenath mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.00...5.10 Prestroke mm

: (4.95...5.15)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

: 0.50 (0.75) Tolerance + - 0

Time to cyl. no. : 1

BASIC SETTING

rpm: 700 1st speed

Rack travel in mm : 14.10...14.20

Del.quantity cm3/: 23.4...23.6

100 s: (23.1...23.9)

cm3 : 0.6Spread

100 s: (0.9)

rpm : 225.0 2nd speed Rack travel in mm: 4.5...4.9

Del.quantity cm3/ : 1.5...1.9

100 s: (-)

cm3 : 0.3Spread 100 s: (0.6)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 225 1st speed

: 1.20...1.60 travel mm

2nd speed rpm : 350

travel mm : 2.40...3.00

3rd speed : 650 man travel mm

: 4.40...5.00 1045

4th speed rpm

: 8.40...8.60 travel mm

: 1160 5th speed mqn travel mm : 9.90...10.30

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 1040

Speed Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed

Aneroid pressure h: 900

Anerona Del.quantity 1000 : 234.0...236.0

: (231.0...239.0)

cm3 : 6.00 Spread

1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 59...67

Testina:

1st rack travel in: 13.10 Speed rpm : 1040...1050 2nd rack travel in: 4.00

rpm : 1145...1175 Speed

4th rack travel in: 1300

rpm : 0.00...1.00Speed

LOW IDLE 1

Control lever

position degrees: 7...15

Testina:

Speed : 100 rpm Minimum rack trave: 6.10

: 225 Speed rom

Rack travel in mm : 4.50...4.70

Rack travel in mm: 2.00

Speed man : 320...380

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 500 rpm

hPa : 900 Pressure

: 14.10...14.20 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 10.30...10.70

2nd pressure hPa : 575 Rack travel in m: 13.00...13.10

3rd pressure hPa : 405

Rack travel in m: 11.10...11.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 1000 Del.quantity cm3/ : 223.0...231.0 1000 s: (221.0...233.0)

Aneroid pressure h: -

: 500 Speed rpm

Del.quantity cm3/: 150.0...154.0 1000 s: (148.0...156.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 13.10 peed rpm : 1040...1050 Speed

STARTING FUEL DELIVERY

rpm

Del.quantity cm3/: 275.0...325.0 1000 s: (-)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 225 Rack travel in mm : 4.50...4.70

Remarks:

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring preload on new delivery-valve holders

to 2.9...3.1 mm.

ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO

diaphragm.

For comb. with letter index see

VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania

on 1988-09-21

Start of delivery - engine: 13° before

Firing sequence of engine: 1-5-3-6-2-4.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : VOL 16,0 b : 10.02.89 Test sheet Edition Replaces : 3.4.87 Test oil : ISO-4113 Combination no. : D 402 646 837 Injection pump Pump designation : PE6P130A720RS7134 EP type number : 0 412 636 805 Governor Governor design. : RQV225...930PA849 Governer no. : 0 421 813 600 Customer-spec. information Customer : VOLVO Engine : TD160 1st version kW : 320.0 : 1860 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly Opening 1 : 207...210 pressure, bar Orifice plate diameter mm : 0.8 Test lines : 1 680 750 067 Outside diameter x Wall thickness x Length mm : 6.00x1.50x1000

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY Test pressure, bar: 25...27

Prestroke mm : 3.60...3.70 : (3.55...3.75) Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.30 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 12.90...13.00

Del.quantity cm3/ : 27.5...27.7

100 s: (27.1...28.1)

Spread cm3 : 0.6

100 s: (1.0)

2nd speed rpm : 225.0 Rack travel in mm : 5.1...5.3 Del.quantity cm3/ : 2.5...2.9 100 s: (2.2...3.2)

Spread cm3 : 0.4 100 s: (0.8)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL 1st speed rpm : 225

travel mm : 0.90...1.00 2nd speed rpm : 440 travel mm : 3.60...3.90

3rd speed rpm : 750 travel mm : 6.40...6.60

4th speed rpm : 980 travel mm : 7.90...8.10 5th speed rpm : 1050

5th speed rpm : 1050 travel mm : 9.20...9.40

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 Speed rpm : 1010

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700 Aneroid pressure h: 700 Del.quantity : 275.0...277.0 1000 : (271.0...281.0)

cm3 : 6.00 1000 : (10.00) Spread

RATED SPEED

1st version Control lever

position degrees: 58...66

Testing:

1st rack travel in: 11.90 rpm : 975...985 Speed 2nd rack travel in: 4.00

Speed rpm : 1040...1070 4th rack travel in: 1200 Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 5...13

Testing:

Speed : 100 rpm Minimum rack trave: 6.60 rpm : 225

Rack travel in mm : 5.10...5.30

CONSTANT REGULATION

: 225...390 Speed

Aneroid/Altitude Compensator Test

1st version Setting

: 500 Speed rom hPa : 700 Pressure

: 12.90...13.00 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : Rack travel in m: 9.70...9.80
2nd pressure hPa : 550
Rack travel in m: 12.70...12.80
3rd pressure hPa : 100

Rack travel in m: 10.00...10.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 700 Del.quantity cm3/ : 182.0...186.0 1000 s: (179.0...189.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.90 rpm : 975...985 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 125.0...145.0 1000 s: (-)

Rack travel in mm : 9.70...9.80

LOW IDLE

Speed rpm : 225
Rack travel in mm : 5.10...5.30
Del.quantity cm3/ : 25.0...29.0

1000 s: (22.0...32.0)

Spread cm3 : 4.00

1000 s: (8.00)

Remarks:

Delivery-valve spring pre-tension 3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring preload on new delivery-valve holders to 2.9...3.1 mm.

Note remarks

Test sheet : SCA 11,1 d Edition : 10.02.89 Replaces : 2.11.87 : ISO-4113 Test oil

: 0 402 646 844 Combination no.

Injection pump

Pump designation : PE6P12OA72ORS7017 EP type number

Governor

Governor design. : RQV200...1000PA539-7

Customer-spec. information

: SAAB-SCANIA

TEST BENCH REQUIREMENTS

Test oil

Test nozzle holder

: 1 688 901 019 assembly

Openina

pressure, bar

Orifice plate

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10 : (4.95...5.15)

: 0 412 626 818

Governer no.

: 0 421 813 631

Customer

Engine

: DSC 11 12

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

: 207...210

: 0,8 diameter mm

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

BEGINNING OF DELIVERY

Rack travel in mm : 9.00...12.00

108

Firing order : 1-5-3-6-2-4

Phasina : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 14.50...14.60

Del.quantity cm3/: 22.0...22.2

100 s: (21.7...22.5)

cm3 : 0.6Spread

100 s: (0.9)

2nd speed rpm : 225.0 Rack travel in mm : 5.3...5.7 Del.quantity cm3/: 1.8...2.2

100 s: (-)

cm3 : 0.3 Spread 100 s: (0.6)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 225

: 1.20...1.60 travel mm

rpm : 350 2nd speed

travel mm : 2.40...3.00

3rd speed : 650 rpm

: 4.50...5.10 travel mm

: 1045 4th speed rpm

: 8.40...8.60 travel mm

: 1165 5th speed rpm

: 10.00...10.40 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1050

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700 Aneroid pressure h: 900

Del.quantity : 220.0...222.0

1000 : (217.0...225.0)

cm3 : 6.00 Spread

1000 : (9.00)

RATED SPEED

1st version Control Lever

position degrees: 59...67

Testing:

1st rack travel in: 13.50

Speed rpm: 1040...1050
2nd rack travel in: 4.00
Speed rpm: 1150...1180
4th rack travel in: 1300

rpm : 0.00...1.00Speed

LOW IDLE 1 Control Lever

position degrees: 7...15

Testing:

Speed : 100 rpm

Minimum rack trave: 6.90 rpm : 225 Speed

Rack travel in mm: 5.30...5.50
Rack travel in mm: 2.00
Speed rpm: 380...440

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed rpm hPa : 900 Pressure

: 14.50...14.60 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 12.30...12.70

2nd pressure hPa : 480

Rack travel in m: 14.10...14.20

3rd pressure hPa : 285

Rack travel in m: 13.00...13.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 1000 Del.quantity cm3/ : 210.0...218.0

1000 s: (208.0...220.0)

Aneroid pressure h: -

: 500 Speed rpm

Del.quantity cm3/: 169.0...173.0 1000 s: (167.0...175.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.50

rpm : 1040...1050 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 240.0...290.0

1000 s: (-)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 225 Rack travel in mm : 5.30...5.50

Remarks:

Delivery-valve spring pre-tension 3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring preload on new delivery-valve holders to 2.9...3.1 mm.

Start-of-delivery setting with ROBO diaphragm.

ADDITIONAL INFORMATION

For comb. with letter index see VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania on 1988-09-21

Start of delivery - engine: 16° before

Firing sequence of engine: 1-5-3-6-2-4.

Note remarks

Test sheet : SCA 11,1 c Edition : 10.02.89 Replaces : 5.2.88

Test oil : ISO-4113

Combination no. : 0 402 646 845

Injection pump

Pump designation : PE6P120A720RS7139

EP type number : 0 412 626 819

Governor

Governor design. : RQV200...1000PA725-2

: 0 421 813 632 Governer no.

Customer-spec. information

: SAAB-SCANIA Customer

: DSC11 13 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Openina |

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

: 1 680 750 015 Test lines

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10 : (4.95...5.15) Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 15.20...15.30

Del.quantity cm3/: 23.6...23.8

100 s: (23.3...24.1)

Spread cm3 : 0.6

100 s: (0.9)

rpm : 225.0 2nd speed

Rack travel in mm : 5.3...5.7 Del.quantity cm3/ : 1.8...2.2

100 s: (-) Spread cm3 : 0.3100 s: (0.6)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 225

: 1.20...1.60 travel mm

2nd speed

rpm : 350 : 2.40...3.00 travel mm

rpm : 650 3rd speed

: 4.40...5.00 travel mm

rpm : 1045 4th speed

: 8.40...8.60 travel mm

rpm : 1170 5th speed : 10.10...10.50 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 1050

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 230.0...241.0)

: 6.00 cm3 Spread 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 59...67

Testing:

1st rack travel in: 14.20 Speed rpm : 1040...1050

2nd rack travel in: 4.00

Speed rpm : 1155...1185 4th rack travel in: 1300 Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 7...15

Testing:

Speed : 100 rpm Minimum rack trave: 6.90 rpm : 225

Rack travel in mm : 5.30...5.50

Rack travel in mm : 2.00 : 380...440 Speed man

Aneroid/Altitude Compensator Test

1st version Setting

Speed rpm : 500 hPa : 900 Pressure

: 15.20...15.30 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 12.30...12.70
2nd pressure hPa : 535
Rack travel in m: 14.60...14.70
3rd pressure hPa : 290

Rack travel in m: 13.10...13.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900 : 1000 Speed rpm

Del.quantity cm3/: 226.0...234.0 1000 s: (224.0...236.0)

Aneroid pressure h: -

: 500 Speed man

Del.quantity cm3/: 169.0...173.0 1000 s: (167.0...175.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 14.20

rpm : 1040...1050 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 240.0...290.0 1000 s: (-)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 225 Rack travel in mm : 5.30...5.50

Remarks:

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring preload on new delivery-valve holders to 2.9...3.1 mm.

Start-of-delivery setting with ROBO

diaphragm.

ADDITIONAL INFORMATION

For comb. with letter index see

VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania

on 1988-09-21

Start of delivery - engine: 15° before

Firing sequence of engine:

1-5-3-6-2-4.

Note remarks

: SCA 11,1 e : 10.02.89 Test sheet Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 402 646 846

Injection pump

Pump designation : PE6P120A720RS7018

: 0 412 626 821 EP type number

Governor

Governor design. : RQV200...1000PA539-8

Governer no. : 0 421 813 635

Customer-spec. information

: SAAB-SCANIA Customer

: DS11 73 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10 : (4.95...5.15)
Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

Spread

1st speed rpm: 700

Rack travel in mm : 13.20...13.30

Del.guantity cm3/: 19.2...19.4

100 s: (18.9...19.7)

cm3 : 0.6

100 s: (0.9)

rpm : 225.0 2nd speed

Rack travel in mm: 4.7...5.1 Del.quantity cm3/: 1.4...1.8

100 s: (-)

cm3 : 0.3Spread

100 s: (0.6)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 225 1st speed

travel mm : 1.20...1.60

rpm : 350 2nd speed

travel mm : 2.40...3.00

3rd speed rpm : 650

: 4.50...5.10 travel mm

rpm : 1045 4th speed

: 8.40...8.60 travel mm : 1150

5th speed rpm : 9.80...10.20 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1050 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 192.0...197.0)

: 6.00 Spread cm3 1000 : (9.00)

RATED SPEED

1st version Control Lever

position degrees: 58...66

Testina:

1st rack travel in: 12.20

Speed rpm : 1040...1050 2nd rack travel in: 4.00

Speed rpm : 1135...1165 4th rack travel in: 1250

rpm : 0.00...1.00Speed

LOW IDLE 1 Control Lever

position degrees: 6...14

Testing:

Speed rpm : 100 Minimum rack trave: 6.30 rpm

Rack travel in mm : 4.70...4.90 Rack travel in mm : 2.00 : 350...410 Speed rom

Aneroid/Altitude Compensator Test

1st version Setting

: 500 Speed rom hPa : 900 Pressure

Rack travel mm : 13.20...13.30

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 11.20...11.60

2nd pressure hPa : 405

Rack travel in m: 12.80...12.90 3rd pressure hPa : 255

Rack travel in m: 11.80...12.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900 : 1000 Speed rpm

Del.quantity cm3/: 187.0...195.0 1000 s: (185.0...197.0)

Aneroid pressure h: -

Speed : 500 rpm

Del.quantity cm3/: 143.0...147.0 1000 s: (141.0...149.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 12.20

rpm : 1040...1050 Speed

STARTING FUEL DELIVERY

rpm : 100

Del.quantity cm3/: 280.0...330.0 1000 s: (-)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 225
Rack travel in mm : 4.70...4.90

Remarks:

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring preload on new delivery-valve holders to 2.9...3.1 mm.

Start-of-delivery setting with ROBO diaphragm.

ADDITIONAL INFORMATION

For comb. with letter index see VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania on 1988-09-12

Start of delivery - engine: 14° before

Firing sequence of engine: 1-5-3-6-2-4.

Note remarks

Test sheet : SCA 9,0 L Edition : 10.02.89

Replaces

Test oil : ISO-4113

: 0 402 646 847 Combination no.

Injection pump

Pump designation : PE6P120A320RS7138

: 0 412 626 822 EP type number

Governor

Governor design. : RQV200...1100PA712-2

: 0 421 813 636 Governer no.

Customer-spec. information

Customer : SAAB-SCANIA

: DSC9 02 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50 : (4.35...4.55)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 12.90...13.00

Del.guantity cm3/: 18.4...18.6

100 s: (18.1...18.9)

Spread cm3 : 0.6

100 s: (0.9)

rpm : 225.0 2nd speed Rack travel in mm: 4.9...5.3

Del.quantity cm3/: 2.1...2.5

100 s: (-)

cm3 : 0.3Spread 100 s: (0.6)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 225 1st speed

: 0.90...1.30 travel mm

2nd speed

rpm : 350 : 2.50...3.10 travel mm

rpm : 650 3rd speed

: 5.40...6.00 travel mm

: 1145 4th speed rpm

: 8.90...9.10 travel mm

rpm : 1290 5th speed

: 10.20...10.60 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 1120

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed Aneroid pressure h: 900

Aneroid Del.quantity 1000 : 184.0...186.0

: (181.0...189.0)

Spread cm3: 6.00

1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 60...68

Testina:

1st rack travel in: 11.90

Speed rpm : 1140...1150

2nd rack travel in: 4.00

Speed rpm : 1275...1305 4th rack travel in: 1400 Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever position degrees: 6...14

Testina:

Speed : 100 rpm

Minimum rack trave: 6.50 : 225 Speed rom

Rack travel in mm : 4.90...5.10 Rack travel in mm : 2.00

: 300...360 Speed rom

Aneroid/Altitude Compensator Test

1st version

Settina

rpm : 500 hPa : 900 Speed rom Pressure

Rack travel mm : 12.90...13.00

Measurement

 $1/\min : 500$ Speed

1st pressure hPa : -

Rack travel in m: 10.90...11.30 2nd pressure hPa : 345 Rack travel in m: 12.40...12.50 3rd pressure hPa : 175 Rack travel in m: 11.30...11.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 1100 Del.quantity cm3/ : 179.0...187.0 1000 s: (177.0...189.0)

Aneroid pressure h: -

: 500 Speed man

Del.quantity cm3/: 132.0...136.0

1000 s: (130.0...138.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.90

rpm : 1140...1150 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 270.0...320.0 1000 s: (-)

Rack travel in mm : 20.00...21.00

LOW IDLE

rpm : 225 Speed

Rack travel in mm : 4.90...5.10

Remarks:

Delivery-valve spring pre-tension 3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring preload on new delivery-valve holders to 2.9...3.1 mm.

Start-of-delivery setting with ROBO diaphragm.

ADDITIONAL INFORMATION

For comb. with letter index see VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania on 1988-09-12

Start of delivery - engine: 15° before

Firing sequence of engine: 1-5-3-6-2-4.

Note remarks

Test sheet : SCA 9,0 L 1 : 10.02.89 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 402 646 848

Injection pump

Pump designation : PE6P12OA32ORS7138

: 0 412 626 822 EP type number

Governor

Governor design. : RQV200...1100PA712-3

Governer no. : 0 421 813 637

Customer-spec. information

Customer : SAAB-SCANIA

Engine : DS9 05

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.40...4.50 Prestroke mm

: (4.35...5.55) Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.20...12.30

Del.quantity cm3/: 16.5...16.7

100 s: (16.2...17.0)

Spread cm3 : 0.6

100 s: (0.9)

rpm : 225.0 2nd speed Rack travel in mm : 4.9...5.3

Del.quantity cm3/: 2.1...2.5

100 s: (-) cm3 : 0.3

Spread 100 s: (0.6)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 225 1st speed

: 0.90...1.30 travel mm

rpm : 350 2nd speed

travel mm : 2.50...3.10

3rd speed rpn: : 650

: 5.40...6.00 travel mm

rpm : 1145 4th speed

: 8.90...9.10 travel mm

: 1280 5th speed rpm

: 10.10...10.50 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1120 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed Aneroid pressure h: 900

Del.quantity : 100.0...170.0)

: 6.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 59...67

Testing:

1st rack travel in: 11.20 Speed rpm : 1140...1150 2nd rack travel in: 4.00

Speed rpm : 1265...1295

4th rack travel in: 1400

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 6...14

Testing:

Speed : 100 rpm Minimum rack trave: 6.50

Speed rpm

Rack travel in mm : 4.90...5.10

Rack travel in mm : 2.00

: 300...360 Speed rom

Aneroid/Altitude Compensator Test

1st version

Setting Speed

: 500 rom Pressure hPa : 900

: 12.20...12.30 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 10.60...11.00

2nd pressure hPa : 360

Rack travel in m: 11.80...11.90

3rd pressure hPa : 240

Rack travel in m: 11.00...11.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

: 1100 Speed rpm

Del.quantity cm3/: 163.0...171.0 1000 s: (161.0...173.0)

Aneroid pressure h: -

: 500 Speed rpm

Del.quantity cm3/: 125.0...129.0 1000 s: (123.0...131.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.20

rpm : 1140...1150 Speed

STARTING FUEL DELIVERY

: 100 rpm

Del.quantity cm3/: 270.0...320.0 1000 s: (-)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 225 Rack travel in mm : 4.90...5.10

Remarks:

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring preload on new delivery-valve holders

to 2.9...3.1 mm.

Start-of-delivery setting with ROBO

diaphragm.

ADDITIONAL INFORMATION

For comb. with letter index see

VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania

on 1988-09-12

Start of delivery - engine: 13° before

TDC

Firing sequence of engine:

1-5-3-6-2-4.

Note remarks

: VOL 16,2 a : 10.02.89 : 2.6.87 Test sheet Edition Replaces Test oil : ISO-4113

: 0 402 646 849 Combination no.

Injection pump

Pump designation : PE6P130A720RS7137 EP type number : 0 412 636 806

Governor

Governor design. : RQ750PA865 : 0 421 801 401 Governer no.

Customer-spec. information Customer : VOLVO

Engine : TID162 AG

: 350.0 1st version kW : 1500 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

: 1 680 750 067 Test lines

Outside diameter

x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.60...3.70

: (3.55...3.75)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 11.40...11.50

Del.quantity cm3/: 34.1...34.3

100 s: (33.8...34.6)

Spread cm3 : 0.5

100 s: (0.9)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed

: 341.0...343.0 Del.quantity

1000 : (338.0...346.0)

: 5.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version

Testing:

1st rack travel in: 10.40

rpm : 750...755 Speed

2nd rack travel in: 4.00

: 777...790 Speed rpm

4th rack travel in: 840

Speed : 0.00...1.00 rpm

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.40

rpm : 750...755 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 270.0...310.0 1000 s: (260.0...320.0)

HIGH IDLE

1st version

rpm : 781 cm3 : 5.00 1000 s: (7.00) Speed Spread

Remarks:

APPLICATION

Generator

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : (3.55...3.75)
Rack travel in mm : 9.00...12.00 Note remarks Firing order : PEN 16,2 a : 10.02.89 : 20.11.87 Test sheet Edition Replaces Test oil : ISO-4113 Phasing Combination no. : 0 402 646 850 Injection pump Pump designation : PE6P130A720RS7140 EP type number : 0 412 636 807 Governor Governor design. : RQV250...900PA869 : 0 421 813 634 Governer no. Customer-spec. information Customer : VOLVO-PENTA : TID 162 AP Engine 1st version kW : 357.0 Spread : 1800 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve Spread : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly **Opening** : 207...210 pressure, bar Orifice plate diameter mm : 0,8 Test lines : 1 680 750 067 Outside diameter x Wall thickness x Length mm : 6.00X1.50X1000 (A) Injection pump setting values Speed Insp. values in parentheses Set equal delivery quant.

: 1-5-3-6-2-4 : 0-60-120-180-240-300 Tolerance + - 0 : 0.30 (0.75) Time to cyl. no. : 1 BASIC SETTING rpm: 700 1st speed Rack travel in mm : 10.20...10.30 Del.quantity cm3/: 29.2...29.4 100 s: (28.8...29.8) cm3 : 0.5100 s: (0.9) 2nd speed rpm : 250.0 Rack travel in mm : 3.7...3.9 Del.quantity cm3/ : 1.7...2.2 100 s: (1.4...2.4) cm3 : 0.5100 s: (0.7) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 250 0.90...1.30 travel mm 350 2.00...2.60 2nd speed rpm : travel mm 3rd speed : 700 rpm travel mm : 4.40...5.00 4th speed : 925 rpm : 7.30...7.50 travel mm 5th speed : 985 man travel mm : 8.10...8.50 GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 980 Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 700

: 3.60...3.70

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Del.quantity : 292.0...298.0) cm3 : 5.00 1000 : (9.00) Spread RATED SPEED 1st version Control lever position degrees: 55...63 Testing: 1st rack travel in: 9.20 rpm : 920...925 Speed 2nd rack travel in: 4.00 rpm : 970...1000 Speed 4th rack travel in: 1100 Speed rpm : 0.00...1.00LOW IDLE 1 Control lever position degrees: 6...14 Testing: Speed rpm : 100 Minimum rack trave: 5.30 Speed rpm : 250 Rack travel in mm : 3.70...3.90 CONSTANT REGULATION rpm : 250...360 Speed **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 9.20 rpm : 920...925 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 220.0...260.0 1000 s: (-) LOW IDLE Remarks:

Delivery-valve spring pre-tension

J21

3.2...3.4 mm. Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring preload on new delivery-valve holders to 2.9...3.1 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks

Test sheet : SCA 11,1 f : 10.02.89 Edition

Replaces

Test oil : ISO-4113

: 0 402 646 854 Combination no.

Injection pump

Pump designation : PE6P120A720RS7019 EP type number : 0 412 626 823

Governor

Governor design. : RQ200/1000PA713-2

Governer no. : 0 421 801 408

Customer-spec. information

Customer : SAAB-SCANIA

: DS11 71 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening |

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.00...5.10 Prestroke mm : (4.95...5.15)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 700 1st speed

Rack travel in mm : 11.40...11.50

Del.quantity cm3/: 16.1...16.3

100 s: (15.8...16.6)

cm3 : 0.6Spread

100 s: (0.9)

2nd speed rpm : 225.0 Rack travel in mm : 4.7...5.1 Del.quantity cm3/: 1.6...2.0

100 s: (-) cm3 : 0.3 100 s: (0.6) Spread

GUIDE SLEEVE POSITION Control-lever position

Degree: -2 rpm : 600

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed Aneroid pressure h: 900

Del.quantity : 161.0...163.0 1000 : (158.0...166.0)

: 6.00 Spread cm3 1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600 Rack travel in mm : 16.5 : 600

Testing:

1st rack travel in: 10.40

rpm : 1045...1060 Speed

2nd rack travel in: 4.00

rpm : 1170...1200 Speed

4th rack travel in: 1300

rpm : 0.00...1.00Speed

LOW IDLE 1

Setting point w/out bumper spring

rpm : 225 Rack travel in mm: 4.8

Testing:

rpm : 100 Speed Minimum rack trave: 6.30 rpm : 225

Rack travel in mm : 4.70...4.90 Rack travel in mm : 2.00 : 310...350 Speed rom

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 500 Pressure hPa : 900

: 11.40...11.50 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -Rack travel in m: 9.30...9.70

2nd pressure hPa : 320 Rack travel in m: 10.80...10.90

3rd pressure hPa : 180

Rack travel in m: 9.90...10.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900 : 1000 Speed rpm

Del.quantity cm3/: 174.0...182.0

1000 s: (172.0...184.0)

Aneroid pressure h: -

: 500 Speed rpm

Del.quantity cm3/: 112.0...116.0 1000 s: (110.0...118.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 10.40

rpm : 1045...1060 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 275.0...325.0

1000 s: (-)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 225 Rack travel in mm : 4.70...4.90

Remarks:

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

See VDT-I-460/138.

Start-of-delivery setting with ROBO

diaphragm.

ADDITIONAL INFORMATION

For comb. with letter index see

VDT-I-400/116.

For sealing see VDT-I-400/117.

Scania test specifications taken over

on Sep. 5, 1988

Start of delivery - engine: 14° before

Firing sequence of engine:

1-5-3-6-2-4.

Omnibus

Note remarks

: SCA 11,1 g : 10.02.89 Test sheet

Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 402 646 855

Injection pump

Pump designation : PE6P120A720RS7018

EP type number : 0 412 626 821

Governor

Governor design: RQ200/1000PA713-3

: 0 421 801 414 Governer no.

Customer-spec. information

Customer : SAAB-SCANIA

: DS11 73 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 019

Openina

pressure, bar : 207...210

Orifice plate

diameter mm : 0.8

: 1 680 750 015 Test lines

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.00...5.10 Prestroke mm

: (4.95...5.15)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 13.20...13.30

Del.guantity cm3/: 19.2...19.4

100 s: (18.9...19.7)

Spread cm3 : 0.6

100 s: (0.9)

rpm : 225.0 2nd speed Rack travel in mm: 4.7...5.1 Del.quantity cm3/: 1.4...1.8

100 s: (-)

cm3 : 0.3Spread

100 s: (0.6)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700 Aneroid pressure h: 900

: 192.0...194.0 Del.quantity 1000 : (189.0...197.0)

: 6.00 Spread cm3

: (9.00) 1000

RATED SPEED

1st version

Setting point:

: 600 rpm Rack travel in mm: 16.5

Testing:

1st rack travel in: 12.20

rpm : 1045...1060 Speed

2nd rack travel in: 4.00

rpm : 1190...1220 Speed

4th rack travel in: 1350

rpm : 0.00...1.00 Speed

LOW IDLE 1

Setting point w/out bumper spring

rpm : 225 Rack travel in mm: 4.8

Testing:

Speed : 100 rpm Minimum rack trave: 6.30 Speed rpm

Rack travel in mm : 4.70...4.90

Rack travel in mm : 2.00

Speed : 310...350 rpm

Aneroid/Altitude Compensator Test

1st version Setting

Speed rpm : 500 hPa : 900 Pressure

: 13.20...13.30 Rack travel mm

Measurement

Speed  $1/\min : 500$ 

1st pressure hPa : -

Rack travel in m: 11.20...11.60

2nd pressure hPa : 405
Rack travel in m: 12.80...12.90
3rd pressure hPa : 255
Rack travel in m: 11.80...12.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 1000 Del.quantity cm3/ : 187.0...195.0 1000 s: (185.0...197.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/ : 143.0...147.0

1000 s: (141.0...149.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 12.20 peed rpm : 1045...1060 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 280.0...330.0 1000 s: (-) Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 225 Rack travel in mm : 4.70...4.90

Remarks:

Delivery-valve spring pre-tension 3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring preload on new delivery-valve holders to 2.9...3.1 mm.

Start-of-delivery setting with ROBO diaphragm.

ADDITIONAL INFORMATION

For comb. with letter index see VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania on 1988-09-12

Start of delivery - engine: 14° before

Firing sequence of engine: 1-5-3-6-2-4.

**Omnibus** 

Note remarks

: PEN 16,2 b : 10.02.89 Test sheet Edition Replaces : 12.2.88 Test oil : ISO-4113

Combination no. : 0 402 646 857

Injection pump

Pump designation : PE6P130A720RS7150 EP type number : 0 412 636 808

Governor

Governor design. : RQV250...900PA881 : D 421 813 676 Governer no.

Customer-spec. information

: VOLVO-PENTA Customer

: TAMD 162 (HD) Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.60...3.70 : (3.55...3.75)
Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - 0 : 0.30 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 10.30...10.40

Del.guantity cm3/: 29.7...29.9

100 s: (29.3...30.3)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 250.0 2nd speed Rack travel in mm : 3.7...3.9 Del.quantity cm3/: 1.7...2.2 100 s: (1.4...2.4)

cm3 : 0.5

Spread 100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 250 1st speed

: 0.90...1.30 travel mm 2nd speed rpm : 350

2.00...2.60 travel mm

3rd speed rom : 700

: 4.40...5.00 travel mm

925 4th speed rpm

: 7.30...7.50 travel mm 5th speed rpm : 985

: 8.10...8.50 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 980

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed Aneroid pressure h: 900

Del.quantity : 297.0...299.0

1000 : (293.0...303.0)

cm3 : 5.00 1000 : (9.00) Spread

RATED SPEED

1st version Control Lever

position degrees: 55...63

Testina:

1st rack travel in: 9.30 Speed rpm : 925...935 2nd rack travel in: 4.00

rpm : 975...1005 Speed

4th rack travel in: 1100

rpm : 0.00...1.00Speed

LOW IDLE 1 Control lever

position degrees: 6...14

Testing:

Speed rpm : 100 Minimum rack trave: 5.30 Speed rpm : 250 Rack travel in mm : 3.70...3.90

CONSTANT REGULATION

rpm : 250...400 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed rpm hPa : 900 Pressure

: 10.30...10.40 Rack travel mm

Measurement

1/min : 500 Speed

1st pressure hPa : -

Rack travel in m: 7.70...7.90

2nd pressure hPa : 310 Rack travel in m: 7.90...8.00

3rd pressure hPa : 660

Rack travel in m: 9.90...10.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 700 Del.quantity cm3/ : 192.0...196.0

1000 s: (189.0...199.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 9.30

rpm : 925...935 Speed

STARTING FUEL DELIVERY

Speed : 100 rpm

LOW IDLE

Speed rpm

Rack travel in mm : 3.70...3.90 Del.quantity cm3/: 17.0...22.0 1000 s: (14.5...24.5)

cm3 : 5.00 Spread

1000 s: (7.00)

Remarks:

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring preload on new delivery-valve holders to 2.9...3.1 mm.

Note remarks

Test sheet : SCA 11,1 h : 10.02.89 Edition

Replaces Test oil

: ISO-4113

Combination no. : 0 402 646 858

Injection pump

Pump designation : PE6P120A720RS7151 : 0 412 626 824 EP type number

Governor

Governor design. : RQ200/900PA713-4 Governer no. : 0 421 801 424

Customer-spec. information

: SAAB-SCANIA Customer

Engine : DSC11 04

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.40...4.50 Prestroke mm : (4.35...4.55)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm : 7001st speed

Rack travel in mm : 12.70...12.80

Del.quantity cm3/: 17.4...17.6

100 s: (17.1...17.9)

cm3 : 0.6Spread

100 s: (0.9)

2nd speed rpm : 225.0
Rack travel in mm : 4.8...5.2
Del.quantity cm3/ : 1.6...2.0

100 s: (-)

Spread cm3 : 0.3

100 s: (0.6)

GUIDE SLEEVE POSITION Control-Lever position

Degree: -2

rpm : 600 Speed Rack travel in mm : 0.00...15.20

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

: 174.0...176.0 Del.quantity

1000 : (171.0...179.0)

cm3 : 6.00 Spread

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm Rack travel in mm : 7.6

Testing:

1st rack travel in: 11.70

rpm : 945...960 Speed

2nd rack travel in: 4.00 rpm : 1050...1080 Speed

4th rack travel in: 1200 Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring

rpm Rack travel in mm: 4.9

Testina:

Speed rpm : 100 Minimum rack trave: 6.40 rpm : 225

Rack travel in mm : 4.80...5.00 Rack travel in mm : 2.00 Speed rpm : 310...350

Aneroid/Altitude Compensator Test

1st version Setting

Speed : 500 rpm hPa : 900 Pressure

: 12.70...12.80 Rack travel mm

Measurement

Speed 1/min: 500

1st pressure hPa : -

Rack travel in m: 11.40...11.80
2nd pressure hPa : 395
Rack travel in m: 12.50...12.60
3rd pressure hPa : 290

Rack travel in m: 11.90...12.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900 rpm : 900 Speed

Del.quantity cm3/: 171.0...179.0 1000 s: (169.0...181.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/ : 145.0...149.0 1000 s: (143.0...151.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.70 rpm : 945...960 Speed

LOW IDLE

Speed rpm : 225 Rack travel in mm : 4.80...5.00

Remarks:

Delivery-valve spring pre-tension 3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring preload on new delivery-valve holders to 2.9...3.1 mm.

Start-of-delivery setting with ROBO diaphragm.

ADDITIONAL INFORMATION

For comb. with letter index see VDT-I-400/116.

For sealing see VDT-I-400/117.

Scania test specifications taken over on Sep. 5, 1988

Start of delivery - engine: 9° before TDC

Firing sequence of engine: 1-5-3-6-2-4.

Omnibus

Note remarks

Test sheet : SCA 9,0 L 2 : 07.02.89 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 402 646 860

Injection pump

Pump designation : PE6P120A320RS7138 : 0 412 626 822 EP type number

Governor

Governor design. : RQV350...1100PA795-1

: D 421 813 693 Governer no.

Customer-spec. information

: SAAB-SCANIA Customer

Engine : DS9 52,53,54,55

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50 : (4.35...4.55)

Rack travel in mm : 9.00...12.00

K<sub>0</sub>2

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 12.20...12.30

Del.quantity cm3/: 16.5...16.7

100 s: (16.2...17.0)

cm3 : 0.6Spread

100 s: (0.9)

2nd speed rpm : 350.0 Rack travel in mm: 4.3...4.9

Del.quantity cm3/: 2.0...2.4 100 s: (1.7...2.7)

cm3 : 0.3Spread

100 s: (0.6)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

: 1.30...1.70 travel mm

2nd speed rpm : 650

: 4.10...4.70 travel mm

: 1145 3rd speed rpm

: 7.80...8.00 travel mm : 1255

4th speed rpm

: 8.80...9.20 travel mm

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 1180 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

: 165.0...167.0 Del.quantity

: (162.0...170.0) 1000

cm3 : 6.00 Spread

1000 : (9.00)

RATED SPEED

1st version Control Lever

position degrees: 42...50

Testing:

1st rack travel in: 11.20

Speed rpm: 1140...1150 2nd rack travel in: 4.00

Speed rpm : 1240...1270 4th rack travel in: 1400 Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 11...19

Testing:

Speed man : 100 Minimum rack trave: 6.10 rpm : 350

Rack travel in mm : 4.50...4.70

Rack travel in mm : 2.00

: 370...430 Speed rpm

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1100

Del.quantity cm3/: 163.0...171.0 1000 s: (161.0...173.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.20

rpm : 1140...1150 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 270.0...320.0

1000 s: (-)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 350 Rack travel in mm : 4.30...4.90

Del.quantity cm3/: 20.0...24.0 1000 s: (17.0...27.0) Spread cm3 : 3.00 1000 s: (6.00)

Remarks:

K03

Delivery-valve spring pre-tension 3.2...3.4 mm. Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring preload on new delivery-valve holders to 2.9...3.1 mm.

Start-of-delivery setting with ROBO diaphragm.

ADDITIONAL INFORMATION

For comb. with letter index see VDT-I-400/116.

For sealing see VDT-I-400/117.

Scania test specifications taken over on Oct. 17, 1988

Start of delivery - engine: 13° before

Firing sequence of engine: 1-5-3-6-2-4.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : SCA 9,0 L 3 Test sheet Edition : 07.02.89 Replaces Test oil : ISO-4113 : 0 402 646 861 Combination no. Injection pump Pump designation : PE6P120A320RS7138 : 0 412 626 822 EP type number Governor : RQV300....925PA712-4 Governor design. Governer no. : 0 421 813 701 Customer-spec. information : SAAB-SCANIA Customer : DS9 52,53,54,55 Engine TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly Openina : 207...210 pressure, bar Orifice plate diameter mm : 0,8 : 1 680 750 015 Test lines Outside diameter x Wall thickness x Length mm : 6.00x1.50x600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

Phasing : 0-60-120-180-240-300 Tolerance + - 0 : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 700 Rack travel in mm : 12.20...12.30 Del.quantity cm3/: 16.5...16.7 100 s: (16.2...17.0) cm3 : 0.6 Spread 100 s: (0.9) rpm : 300.0 2nd speed Rack travel in mm : 4.6...5.0 Del.quantity cm3/: 2.0...2.4 100 s: (-) Spread cm3 : 0.3100 s: (0.6) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 300 1st speed : 1.40...1.80 travel mm rpm : 350 2nd speed : 1.90...2.50 travel mm 3rd speed rpm : 650 travel mm : 4.70...5.30 4th speed : 970 rpm travel mm : 8.40...8.60 5th speed : 1045 rpm travel mm : 9.30...9.70 GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 970 Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 700 : 165.0...167.0 Del.quantity 1000 : (162.0...170.0) : 6.00 Spread cm3 : (9.00) 1000

: 1-5-3-6-2-4

Firing order

K04

BEGINNING OF DELIVERY

Prestroke mm

Test pressure, bar: 25...27

Rack travel in mm : 9.00...12.00

: 4.40...4.50

: (4.35...4.55)

#### RATED SPEED

1st version Control lever

position degrees: 44...52

Testing:

1st rack travel in: 11.20 rpm : 965...975 Speed 2nd rack travel in: 4.00

rpm : 1030...1060 Speed

4th rack travel in: 1150

rpm : 0.00...1.00Speed

LOW IDLE 1 Control lever

position degrees: 12...20

Testing:

: 100 Speed rpm Minimum rack trave: 6.20 : 300 rpm Speed

Rack travel in mm : 4.60...4.80

Rack travel in mm: 2.00

: 330...390 Speed man

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1100 Del.quantity cm3/ : 163.0...171.0 1000 s: (161.0...173.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.20 : 965...975 Speed rpm

STARTING FUEL DELIVERY

: 100 Speed rpm

vel.quantity cm3/: 270.0...320.0

1000 s: (-)

Rack travel in mm : 20.00...21.00

LOW IDLE

: 300 Speed rpm

Rack travel in mm : 4.60...4.80

Remarks:

Delivery-valve spring pre-tension 3.2...3.4 mm. Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring preload on new delivery-valve holders to 2.9...3.1 mm.

Start-of-delivery setting with ROBO diaphragm.

ADDITIONAL INFORMATION

For comb. with letter index see VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania on 1988-09-12

Start of delivery - engine: 13° before

Firing sequence of engine: 1-5-3-6-2-4.

Note remarks

: MB 14,7 a 2 : 28.11.88 Test sheet Edition

: 6.86 Replaces : ISO-4113 Test oil

: 0 402 648 817 Combination no.

Injection pump

Pump designation : PE8P12OA320LS7801

EP type number : 0 412 628 806

Governor

Governor design. : RQ300/1050PA762-5

: 0 421 801 399 Governer no.

Customer-spec. information

Customer : DAIMLER-BENZ

: 0M442 A Engine

1st version kW : 260.0 : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 019 assembly

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30 : (5.15...5.35) Rack travel in mm : 20.00...21.00

: 8- 7- 2- 6- 3- 5-Firing order

: 0-45-90-135-180-225-Phasing

270-315

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm: 500

Rack travel in mm : 14.10...14.30

Del.quantity cm3/: 20.3...20.5

100 s: (20.0...20.8)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 300.0 2nd speed

Rack travel in mm: 6.0...6.4 Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

cm3 : 0.6 Spread

100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600 Speed

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 500 Aneroid pressure h: 650

: 203.0...205.0 Del.quantity

1000 : (200.0...208.0)

: 5.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed : 600 rpm

Rack travel in mm : 20.0 FUEL DELIVERY CHARACTERISTICS Testing: 1st rack travel in: 11.80 1st version : 1095...1110 Aneroid pressure h: 1050 Speed rom 2nd rack travel in: 4.00 : 1050 Speed rpm Del.quantity cm3/: 180.0...183.0 1000 s: (177.0...186.0) : 1170...1200 Speed rpm 4th rack travel in: 1300 rom : 0.00...1.50cm3 : 8.00Speed Spread 1000 s: (12.0) Aneroid pressure h: 1050 LOW IDLE 1 : 700 Setting point w/out bumper spring Speed rpm Del.quantity cm3/: 215.0...219.0 rpm : 300 Rack travel in mm: 6.2 1000 s: (212.0...222.0) cm3 : 8.00Spread Testing: 1000 s: (12.0) Aneroid pressure h: 1050 Speed rpm : 200 : 850 Minimum rack trave: 8.00 Speed rpm Del.quantity cm3/: 206.0...210.0 1000 s: (203.0...213.0) rpm : 300 Speed Rack travel in mm: 6.00...6.40 Rack travel in mm: 2.00 Speed rpm: 380...420 cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: Speed rpm : 500 Del.quantity cm3/ : 149.0...151.0 1000 s: (146.0...154.0) TORQUE CONTROL Dimension a mm : 0.75 : 1050 2nd speed rpm Rack travel in m: 12.80...13.00 Spread cm3 : 8.00: 850 1000 s: (12.0) 3rd speed rpm Rack travel in m: 13.70...14.00 rpm : 700 4th speed Rack travel in m: 14.40...14.60 **BREAKAWAY** Aneroid/Altitude 1st version 1mm rack travel less than Compensator Test full load rack tr: 11.80 rpm : 1095...1110 1st version Speed Setting : 600 STARTING FUEL DELIVERY Speed rpm hPa : 650 Pressure : 14.10...14.30 Rack travel mm Speed rpm : 100 Del.guantity cm3/: 175.0...190.0 Measurement 1/min: 600 1000 s: (171.0...194.0) Speed 1st pressure hPa : 300
Rack travel in m: 12.40...12.60
2nd pressure hPa : 400
Rack travel in m: 13.40...13.70 Remarks: \* Increase in control-rod travel with 3rd pressure hPa : 850 respect to setting at least 0.1 mm Rack travel in m: 14.20...14.30 \* 4th pressure hPa : -Rack travel in m: 11.40...11.70 5th pressure hPa : 1050 Rack travel in m: 14.40...14.60 START CUT-OUT 1/min: 220 (240) Speed

Note remarks

Test sheet : MB 14,7 b 1 Edition : 03.03.89 Replaces : 12.9.86 : ISO-4113 Test oil

: 0 402 648 825 Combination no.

Injection pump

Pump designation : PE8P120A320LS7801 EP type number : 0 412 628 806

Governor

Governor design. : RQV300..1050PA797-3

: 0 421 813 627 Governer no.

Customer-spec. information

: DAIMLER-BENZ Customer

: 0M442 A Engine

: 260.0 1st version kW Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 019 assembly

Opening |

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

: 1 680 750 067 Test lines

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.20...5.30 : (5.15...5.35)

Rack travel in mm : 20.00...21.00 : 8- 7- 2- 6- 3- 5-Firing order

: 0-45-90-135-180-225-Phasing

270-315

: 0.50 (0.75) Tolerance + - 0

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 500

Rack travel in mm : 14.10...14.30

Del.quantity cm3/: 20.3...20.5

100 s: (20.0...20.8)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 300.0 2nd speed Rack travel in mm : 6.0...6.4 Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

300 1st speed rpm : travel mm 1.20...1.40

: 600 2nd speed rpm

4.90...5.10 travel mm

3rd speed 1075 rpm

: 7.40...7.60 travel mm

: 1100 4th speed rom

: 8.00...8.20 travel mm

rpm : 1150 5th speed

: 9.00...9.20 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm : 1125 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

2nd pressure hPa : 400 Rack travel in m: 13.40...13.70 1st version rpm : 500 3rd pressure hPa : 850 Speed Aneroid pressure h: 650 Rack travel in m: 14.20...14.30 : 203.0...205.0 4th pressure hPa : Del.quantity Rack travel in m: 11.30...11.60 5th pressure hPa : 1050 Rack travel in m: 14.30...14.50 1000 : (200.0...208.0) cm3 : 5.00 1000 : (9.00) Spread START CUT-OUT RATED SPEED 1st version 1/min : 220 (240) Speed Control Lever position degrees: 51...59 FUEL DELIVERY CHARACTERISTICS Testina: 1st rack travel in: 11.80 Speed rpm : 1090...1100 1st version Aneroid pressure h: 1050 2nd rack travel in: 4.00 : 1050 Speed rpm Speed rpm: 1155...1185 4th rack travel in: 1300 Del.quantity cm3/: 180.0...183.0 1000 s: (177.0...186.0) rpm : 0.00...1.00 cm3 : 8.00 Speed Spread 1000 s: (12.0) Aneroid pressure h: 1050 LOW IDLE 1 Control lever Speed rpm : 700 Del.quantity cm3/: 215.0...219.0 1000 s: (212.0...222.0) position degrees: 13...21 cm3 : 8.00 Spread Testina: 1000 s: (12.0) Aneroid pressure h: 1050 Speed rpm : 200 Minimum rack trave: 7.70 : 850 Speed rpm rpm Del.quantity cm3/: 206.0...210.0 1000 s: (203.0...213.0) Rack travel in mm : 6.00...6.40 CONSTANT REGULATION : 8.00 Spread cm3 : 300...450 1000 s: (12.0) Speed rpm Aneroid pressure h: -: 500 TORQUE CONTROL Speed rpm Del.quantity cm3/: 149.0...151.0 Dimension a mm : 1.40 nd speed rpm : 1050 Rack travel in m: 12.70...12.90 rd speed rpm : 850 1000 s: (146.0...154.0) 2nd speed cm3 : 8.00Spread 1000 s: (12.0) 3rd speed rpm Rack travel in m: 13.70...14.00 rpm : 700 4th speed Rack travel in m: 14.30...14.50 **BREAKAWAY** Aneroid/Altitude 1st version 1mm rack travel less than Compensator Test full load rack tr: 11.80 rpm : 1090...1100 1st version Speed Setting : 600 STARTING FUEL DELIVERY Speed rpm hPa : 650 Pressure : 14.10...14.30 Rack travel mm : 100 Speed rpm Del.quantity cm3/: 175.0...190.0 1000 s: (171.0...194.0) Measurement 1/min: 600 Speed 1st pressure hPa : 300 Rack travel in m: 12.40...12.60 Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

Note remarks

: SCA 14,0 h1 : 07.02.89 : 15.1.88 Test sheet Edition Replaces : ISO-4113 Test oil

Combination no. : 0 402 648 836

Injection pump

Pump designation : PE8P120A920/4LS7125T

: 0 412 628 824 EP type number

Governor

Governor design. : RQV200...950PA736-4

: 0 421 813 646 Governer no.

Customer spec. information

: SAAB-SCANIA Customer

: DSC14 03 L09,L10 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening |

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

: 1 680 750 015 Test lines

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.00...5.10 Prestroke mm

: (4.95...5.15)

Rack travel in mm : 9.00...12.00

Firing order

: 1- 2- 7- 3- 4- 5-

Phasing

: 0-45-90-135-180-225-

270-315

: 0.50 (0.75) Tolerance + - 0

Time to cyl. no. : 1

BASIC SETTING

rpm: 700 1st speed

Rack travel in mm : 13.80...13.90

Del.quantity cm3/: 22.1...22.3

100 s: (21.8...22.6)

cm3 : 0.6Spread

100 s: (0.9)

rpm : 225.0 2nd speed Rack travel in mm: 4.9...5.3

Del.quantity cm3/: 1.6...2.0

100 s: (-) cm3 : 0.3 Spread

100 s: (0.6)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 225

: 1.20...1.60 travel mm

rpm : 350 2nd speed

: 2.30...2.90 travel mm rpm : 650

3rd speed

: 4.40...5.00 travel mm

4th speed

rpm : 995 : 7.70...7.90 travel mm

rpm : 1125 5th speed

: 9.30...9.70 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1040 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed

Aneroid pressure h: 900

Del.quantity : 221.0...226.0)

: 6.00 cm3 Spread

1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 56...64

Testing:

1st rack travel in: 12.80 Speed rpm : 990...1000 2nd rack travel in: 4.00

rpm : 1110...1140 Speed

4th rack travel in: 1250

rpm : 0.00...1.00Speed

LOW IDLE 1

Control lever

position degrees: 7...15

Testing:

: 100 Speed rpm Minimum rack trave: 6.50

: 225 Speed rpm

Rack travel in mm : 4.90...5.10

Rack travel in mm : 2.00

: 360...420 Speed rom

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed rpm Pressure hPa : 900

Rack travel mm : 13.80...13.90

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 10.60...11.00
2nd pressure hPa : 445
Rack travel in m: 12.90...13.00
3rd pressure hPa : 325
Rack travel in m: 11.40...11.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 950 Del.quantity cm3/ : 211.0...219.0 1000 s: (209.0...221.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/: 138.0...142.0 1000 s: (136.0...144.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.80

rpm : 990...1000 Speed

STARTING FUEL DELIVERY

rpm : 100

Del.quantity cm3/: 240.0...290.0 1000 s: (-)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 225 Rack travel in mm : 4.90...5.10

Remarks:

Test specifications approved by Scania

on 1987-12-15

Because of flattening, set the spring preload on new delivery-valve holders

to 2.9...3.1 mm.

ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO

diaphragm.

For comb. with letter index see

VDT-I-400/116.

For sealing see VDT-I-400/117.

\* Increase in control-rod travel with

respect to setting at least 0.1 mm

Start of delivery - engine: 16° before

TDC

Engine firing sequence: 1-5-4-2-6-3-7-8

•	
<b>)</b>	
BOSCH INJ. PUMP TEST SPECIFICATIONS	
SCA 14,0 h2 07.02.89 29.1.88 ISO-4113	
0 402 648 839	
PE8P120A920/4LS7125T 0 412 628 824 RQV200950PA736-1 0 421 813 551	
.2	
mation SAAB-SCANIA	
DSC14 03	
TEST BENCH REQUIREMENTS	
3842	
1 417 413 025	
1.50	
1 688 901 019	
207210	
0,8	
1 680 750 015	
6.00x1.50x600	
etting values parentheses ry quant.	

: 1- 2- 7- 3- 4- 5-6-8 : 0-45-90-135-180-225-270-315 Phasing Tolerance + - 0 : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 700 Rack travel in mm : 13.80...13.90 Del.quantity cm3/: 22.1...22.3 100 s: (21.8...22.6) cm3 : 0.6Spread 100 s: (0.9) rpm : 225.0 2nd speed Rack travel in mm : 4.9...5.3 Del.quantity cm3/ : 1.6...2.0 100 s: (-) cm3 : 0.3Spread 100 s: (0.6) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 225 : 1.20...1.60 travel mm rpm : 350 : 2.30...2.90 2nd speed travel mm : 650 3rd speed rpm travel mm : 4.40...5.00 4th speed : 995 rpm : 7.70...7.90 travel mm : 1125 5th speed rpm travel mm : 9.30...9.70 GUIDE SLEEVE POSITION Control-lever position Degree: -1 Speed rpm : 1040 Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 700 Speed Aneroid pressure h: 900 Del.quantity : 221.0...226.0)

Firing order

BEGINNING OF DELIVERY

Prestroke mm

Test pressure, bar: 25...27

Rack travel in mm : 9.00...12.00

: 5.00...5.10

: (4.95...5.15)

cm3 : 6.00 Spread

: (9.00) 1000

#### RATED SPEED

1st version Control lever

position degrees: 56...64

Testing:

1st rack travel in: 12.80 rpm : 990...1000 Speed

2nd rack travel in: 4.00

Speed rpm : 1110...1140 4th rack travel in: 1250

rpm : 0.00...1.00Speed

LOW IDLE 1

Control lever

position degrees: 6...14

Testing:

rpm : 100 Speed Minimum rack trave: 6.50 rpm : 225 Speed

Rack travel in mm : 4.90...5.10 Rack travel in mm : 2.00

: 360...420 Speed rpm

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed rom hPa : 900

Pressure

: 13.80...13.90 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 11.20...11.60

2nd pressure hPa : 365
Rack travel in m: 12.80...12.90
3rd pressure hPa : 215

Rack travel in m: 11.90...12.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900 : 950

Speed rpm Del.quantity cm3/: 211.0...219.0 1000 s: (209.0...221.0)

Aneroid pressure h: -

: 500 Speed rpm

Del.quantity cm3/: 158.0...162.0 1000 s: (156.0...164.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.80

rpm : 990...1000 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 240.0...290.0

1000 s: (-)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 225 Rack travel in mm : 4.90...5.10

Remarks:

Test specifications approved by Scania on 1987-12-15

Because of flattening, set the spring preload on new delivery-valve holders

to 2.9...3.1 mm.

ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO diaphragm.

For comb. with letter index see

VDT-I-400/116.

For sealing see VDT-I-400/117.

\* Increase in control-rod travel with

respect to setting at least 0.1 mm

Start of delivery - engine: 16° before

TDC

Engine firing sequence: 1-5-4-2-6-3-7-8

Note remarks

: MB 14,7 j : 07.02.89 Test sheet Edition : 8.6.88 Replaces : ISO-4113 Test oil

: 0 402 648 844 Combination no.

Injection pump

Pump designation: PE8P120A320LS7816 EP type number : 0 412 628 829

Governor

Governor design. : RQ300/1050PA717-2

: 0 421 801 439 Governer no.

Customer-spec. information

: DAIMLER-BENZ Customer

: CM442 LA Engine

: 353.0 : 2100 1st version kW Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 019 assembly

**Opening** 

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

: 1 680 750 067 Test lines

Outside diameter

x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30 : (5.15...5.35) Rack travel in mm : 20.00...21.00 Firing order : 8-7-2-6-3-5-

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

rpm: 600 1st speed

Rack travel in mm : 13.60...13.80

Del.quantity cm3/: 23.4...23.7

100 s: (23.1...24.0)

cm3 : 0.6Spread

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 5.9...6.5 Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

cm3 : 0.6Spread

100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2 Speed rpm : 600 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 900 Del.quantity

: 234.0...237.0 1000 : (231.0...240.0)

: 6.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version

Setting point:

: 600 Speed rpm

Rack travel in mm: 20.0 Testing: 1st rack travel in: 13.40 : 1095...1110 Speed rpm 2nd rack travel in: 4.00 speed rpm : 1150...1180 4th rack travel in: 1300 Speed rpm LOW IDLE 1 Setting point w/out bumper spring rpm Rack travel in mm: 6.2 Testing: speed rpm : 200 Minimum rack trave: 7.80 Speed Speed rpm : 300 Rack travel in mm : 5.90...6.50 Rack travel in mm : 2.00 : 380...420 Speed rom TORQUE CONTROL Dimension a mm : 0.40 2nd speed : 1050 nar Rack travel in m: 14.40...14.60 : 800 3rd speed rpn Rack travel in m: 14.90...15.10 Aneroid/Aititude Compensator Test 1st version Settina Speed : 600 rom : 900 Pressure hPa : 13.60...13.80 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : 350 Rack travel in m: 11.10...11.30 2nd pressure hPa : 650 Rack travel in m: 12.80...13.00

3rd pressure hPa : 1050

Rack travel in m: 13.70...13.90 \* 4th pressure hPa : -Rack travel in m: 9.90...10.20 5th pressure hPa : 1500 Rack travel in m: 14.80...15.00 START CUT-OUT 1/min: 220 (240) Speed

1st version Aneroid pressure h: 1600 : 1050 Speed rpm Del.quantity cm3/: 252.0...256.0 1000 s: (249.0...259.0) cm3 : 8.00 1000 s: (12.0) Spread Aneroid pressure h: 1600 : 800 Speed man Del.quantity cm3/: 263.0...267.0 1000 s: (260.0...270.0) Spread cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500
Del.quantity cm3/ : 145.0...147.0
1000 s: (142.0...150.0) cm3 : 8.00 Spread 1000 s: (12.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 13.40 Speed rpm : 1095...1110 STARTING FUEL DELIVERY : 100 Speed rpm Del.quantity cm3/: 240.0...260.0 1000 s: (236.0...264.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

FUEL DELIVERY CHARACTERISTICS

## Note remarks

Test sheet : WAU 24,0 a Edition : 17.02.89 : 5.8.88 Replaces : ISO-4113 Test oil

: 0 402 648 847 Combination no.

Injection pump

Pump designation : PE8P130A920/4RS7158

: 0 412 638 801 EP type number

Governor

Governor design. : RQV350...900PA760-1

Governer no. : 0 421 813 617

Customer-spec. information Customer : WAUKESHA

Engine : H24DS/DSI

### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.60...3.70 Prestroke mm : (3.55...3.75)

Rack travel in mm : 9.00...12.00

: 1- 4- 2- 6- 8- 5 - 7- 3 Firing order

: 0-45-090-135-180-225 -270-315 Phasina

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

### BASIC SETTING

rpm: 900 1st speed

Rack travel in mm : 11.70...11.80

Del.quantity cm3/: 36.8...37.1

100 s: (26.5...37.5)

Spread cm3 : 0.6

100 s: (1.0)

rpm : 350.0 2nd speed Rack travel in mm: 4.2...4.4

Del.quantity cm3/: 1.5...2.1 100 s: (1.1...2.5)

cm3 : 1.0Spread 100 s: (1.4)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 350 1st speed

: 1.50...1.80 travel mm

2nd speed rpm : 700 travel mm

: 5.30...5.70 : 950 3rd speed rpm

travel mm : 8.40...8.60

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 950 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed : 900 rpm

368.5...371.5 Del.quantity 1000 : (265.0...375.0)

: 6.00 Spread cm3 : (10.00)

1000

RATED SPEED

1st version Control Lever position degrees: 57...65 Testing: 1st rack travel in: 10.70 Speed rpm: 940...950 2nd rack travel in: 4.00 rpm : 1030...1060 Speed 4th rack travel in: 1150 rpm : 0.00...1.00 Speed LOW IDLE 1 Control Lever position degrees: 5...13 Testing: Speed rpm : 100 Minimum rack trave: 5.80 : 350 Speed rpm Rack travel in mm : 4.20...4.40 CONSTANT REGULATION Speed rpm : 350...450 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.70 rpm : 940...950 Speed INTERMEDIATE RATED SPEED Rack travel in mm: 4.00 STARTING FUEL PELIVERY Speed : 100 rom LOW IDLE : 350 Speed rpm Rack travel in mm : 4.20...4.40 Del.quantity cm3/: 15.0...21.0 1000 s: (11.0...25.0) cm3 : 10.00Spread 1000 s: (14.00) Remarks: **APPLICATION** Navy

Note remarks

Test sheet : WAU 24,0 a1 : 17.02.89 Edition Replaces : 5.8.88

: ISO-4113 Test oil

: 0 402 648 848 Combination no.

Injection pump

Pump designation: PE8P130A920/4RS7158

EP type number : 0 412 638 801

Governor

Governor design: : RQ350/925PA892 : 0 421 801 441 Governer no.

Customer-spec. information Customer : WAUKESHA

Engine : H24DS/DSI

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0.8

Test Lines : 1 680 750 067

Outside diameter x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values

Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.60...3.70

: (3.55...3.75) Rack travel in mm : 9.00...12.00

: 1- 4- 2- 6- 8- 5 Firing order

Phasing : 0-45-090-135-180-225

-270-315 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no.

BASIC SETTING

1st speed rpm: 900

Rack travel in mm : 11.70...11.80

Del.quantity cm3/: 36.8...37.1

100 s: (36.5...37.5)

Spread cm3 : 0.6

100 s: (1.0)

rpm : 350.0 2nd speed Rack travel in mm : 4.2...4.4 Del.quantity cm3/ : 1.5...2.1

100 s: (1.1...2.5)

cm3 : 1.0Spread

100 s: (1.4)

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 600

Rack travel in mm : 15.60...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm

Speed Del.quantity 1000 : 368.5...371.5 : (365.0...375.0)

: 6.00 Spread cm3

1000 : (10.00)

RATED SPEED

1st version

Setting point:

Speed : 600 rpm

Rack travel in mm : 16.0

Testing:

1st rack travel in: 10.70

rpm : 970...985 Speed 2nd rack travel in: 4.00

: 1040...1070 Speed rpm

4th rack travel in: 1150 rpm : 0.00...1.00 Speed LOW IDLE 1 Setting point w/out bumper spring Speed rpm : 350 Rack travel in mm : 4.3 Testing: : 100 Speed rpm Minimum rack trave: 5.80 : 350 Speed rpm Rack travel in mm : 4.20...4.40 Rack travel in mm : 2.00 rpm : 400...440 Speed **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.70 rpm : 970...985 Speed INTERMEDIATE RATED SPEED Rack travel in mm : 4.00 STARTING FUEL DELIVERY Speed : 100 rpm LOW IDLE Speed rpm : 350
Rack travel in mm : 4.20...4.40
Del.quantity cm3/ : 15.0...21.0
1000 s: (11.0...25.0) Spread cm3 : 10.001000 s: (14.00) Remarks:

Navy

**APPLICATION** 

Note remarks

Test sheet : MB 14,7 o : 07.02.89 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 402 648 855

Injection pump

Pump designation : PE8P120A320LS7823 EP type number : 0 412 628 835

Governor

Governor design. : RQV350..1050PA870-5

Governer no. : 0 421 813 735

Customer-spec. information

: DAIMLER-BENZ Customer

Engine : 0M442 LA

1st version kW : 353.0 : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 019

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 : (5.15...5.35) Prestroke mm

Rack travel in mm : 20.00...21.00

: 8-7-2-6-3-5-Firing order

Phasing : 0-45-90-135-180-225-

270-315

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 8

BASIC SETTING

rpm: 600 1st speed

Rack travel in mm : 13.60...13.80

Del.quantity cm3/: 23.4...23.7

100 s: (23.1...24.0)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 350.0 2nd speed Rack travel in mm : 5.9...6.5

Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5)

cm3 : 0.6Spread

100 s: (1.0)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

: 1.90...2.10 travel mm

2nd speed rpm : 800

travel mm : 4.90...5.20

: 1100 3rd speed rpm

: 7.90...8.30 travel mm

: 1175 4th speed rom

: 9.30...9.90 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1100 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

4th pressure hPa : 1500 Rack travel in m: 14.80...15.00 rpm : 600 Speed Aneroid pressure h: 900 Del.quantity : 234.0...237.0 1000 : (231.0...240.0) 5th pressure hPa : Rack travel in m: 9.90...10.20 : 5.00 Spread cm3 : (9.00) 1000 START CUT-OUT RATED SPEED Speed 1/min : 220 (240) 1st version FUEL DELIVERY CHARACTERISTICS Control lever position degrees: 53...61 1st version Aneroid pressure h: 1600 Testing: Speed rpm : 1050 Del.quantity cm3/ : 252.0...256.0 1st rack travel in: 13.40 rpm : 1090...1100 Speed 2nd rack travel in: 4.00 1000 s: (249.0...259.0) rpm : 1160...1190 cm3 : 8.00 Speed Spread 4th rack travel in: 1300 1000 s: (12.0) Aneroid pressure h: 1600 Speed rpm : 0.00...1.00: 800 Speed rpm Del.quantity cm3/: 263.0...267.0 1000 s: (260.0...270.0) LOW IDLE 1 Control Lever cm3 : 8.00 position degrees: 18...26 Spread 1000 s: (12.0) Testing: Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 145.0...147.0 : 250 Speed rpm Minimum rack trave: 8.00 : 350 1000 s: (142.0...150.0) rpm Rack travel in mm : 5.90...6.50 cm3 : 8.00Spread 1000 s: (12.0) CONSTANT REGULATION rpm : 300...500 Speed **BREAKAWAY** TORQUE CONTROL Dimension a mm : 0.50 1st version nd speed rpm : 1050 Rack travel in m: 14.40...14.60 2nd speed 1mm rack travel less than : 800 3rd speed rpm full load rack tr: 13.40 Rack travel in m: 14.90...15.10 rpm : 1090...1100 Speed Aneroid/Altitude STARTING FUEL DELIVERY Compensator Test Speed : 100 rpm Del.quantity cm3/: 240.0...260.0 1000 s: (236.0...264.0) 1st version Setting : 600 Speed rpm hPa : 900 Pressure Remarks: : 13.60...13.80 Rack travel mm : Measurement Speed 1/min: 600 1st pressure hPa : 350 Rack travel in m: 11.10...11.30 2nd pressure hPa : 1050 Rack travel in m: 13.70...13.90
3rd pressure hPa : 1350
Rack travel in m: 14.50...14.70

Note remarks

: MB 14,7 a11 : 03.03.89 Test sheet Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 402 648 859

Injection pump

Pump designation : PE8P120A320LS7801-1

: 0 412 628 818 EP type number

Governor

Governor design. : RQV350...950PA866-4

: 0 421 813 737 Governer no.

Customer-spec. information

Customer : DAIMLER-BENZ

: 0M442 A Engine

1st version kW : 264.0 : 1900 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 019 assembly

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

: 6.00X1.50X1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30 : (5.15...5.35)
Rack travel in mm : 20.00...21.00

: 8- 7- 2- 6- 3- 5-Firing order

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no.

BASIC SETTING

1st speed rpm: 930

Rack travel in mm : 15.30...15.40

Del.quantity cm3/: 20.6...20.8

100 s: (20.3...21.1)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 350.02nd speed

Rack travel in mm: 6.2...6.6 Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

cm3 : 0.6 Spread

100 s: (1.0)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rom : 350 1st speed

: 1.40...1.60 travel mm

rpm : 425 2nd speed travel mm : 2.40...2.60

: 800

3rd speed rpm

: 5.30...5.60 travel mm

: 1000 4th speed rpm

: 7.80...8.20 travel mm

5th speed rpm : 1100

travel mm : 9.40...9.90

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1000 Speed

Rack travel in mm : 16.50...18.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version rpm : 930 Speed Aneroid pressure h: 950 Del.quantity : 206.0...208.0 1000 : (203.0...211.0) Spread cm3 : 5.00 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 51...59 Testing: 1st rack travel in: 14.40 rpm : 980...990 Speed 2nd rack travel in: 4.00 rpm : 1080...1110 Speed 4th rack travel in: 1200 rpm : 0.00...1.00 Speed LOW IDLE 1 Control Lever position degrees: 18...26 Testing: Speed : 250 rpm Minimum rack trave: 8.00 : 350 rom Rack travel in mm : 6.20...6.40 CONSTANT REGULATION rpm : 350...550 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 950 Rack travel in m: 15.30...15.40 COS: mar 2nd speed Rack travel in m: 16.40...16.60 3rd speed rpm : 900 Rack travel in m: 15.90...16.10 Aneroid/Altitude Compensator Test 1st version Setting Speed : 600 rpm Pressure hPa : -: 10.90...11.30 Rack travel mm Measurement 1/min: 600 Speed

Rack travel in m: 11.70...11.90 2nd pressure hPa : 700 Rack travel in m: 13.80...14.00 START CUT-OUT Speed 1/min : 270 (290) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 950 rpm\_ : 800 Del.quantity cm3/: 233.0...237.0 1000 s: (230.0...240.0) cm3 : 8.00Spread 1000 s: (12.0) Aneroid pressure h: 950 Speed rpm Del.quantity cm3/: 167.0...169.0 \* 1000 s: (164.0...172.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 143.0...145.0 1000 s: (140.0...148.0) cm3 : 8.00 Spread 1000 s: (12.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 14.40 rpm : 980...990 STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 190.0...210.0 1000 s: (186.0...214.0) Remarks: \* = Set at reduced-delivery stop.

K24

1st pressure hPa : 450

Note remarks

: MB 18,3 m 1 : 07.02.89 Test sheet Edition : 2.9.88 Replaces : ISO-4113 Test oil

Combination no. : 0 402 649 804

Injection pump

Pump designation : PE10P120A320LS7809-1

EP type number : 0 412 629 801

Governor

Governor design. : RQV300..1050PA797-6

Governer no. : 0 421 813 705

Customer-spec. information

Customer : DAIMLER-BENZ

Engine : 0M443 A

: 331.0 : 2100 1st version kW Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 130...150

Test nozzle holder

: 1 688 901 019 assembly

Opening |

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

: 6.00X1.50X1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.00...4.10 : (3.95...4.15) Prestroke mm

Rack travel in mm : 20.00...21.00

: 10- 9- 4- 1- - 6- 3- 5-7 Firing order

: 0-45-72-117-144-189-Phasing

216-261-288-333

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 10

BASIC SETTING

1st speed rpm: 1050

Rack travel in mm : 13.30...13.40

Del.quantity cm3/: 18.7...19.0

100 s: (18.4...19.3)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 300.02nd speed

Rack travel in mm: 6.5...6.8 Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5)

cm3 : 0.6

Spread 100 s: (1.0)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm 1.20...1.40

2nd speed 600 rpm

: 4.90...5.20 travel mm

rpm : 800 3rd speed

5.80...6.20 travel mm

: 1025 4th speed rpm

: 8.50...9.00 travel mm

: 1175 5th speed rpm

: 9.50...10.10

travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1100 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version Speed rpm : 1050 Aneroid pressure h: 900 Aneroid F. Del.quantity 1000 : 187.0...190.0 : (184.0...193.0) Spread cm3 : 5.00 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 53...61 Testing: 1st rack travel in: 12.30 Speed rpm : 1090...1100 2nd rack travel in: 4.00 Speed rpm : 1150...1180 4th rack travel in: 1300 Speed rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 19...27 Testing: : 200 Speed rom Minimum rack trave: 8.60 : 300 rom Rack travel in mm : 6.50...6.80 CONSTANT REGULATION rpm : 300...400 Speed TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version 1st speed rpm : 1050 Rack travel in m: 13.30...13.40 2nd speed rpm : 750 Rack travel in m: 14.20...14.40 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed man hPa : Pressure : 11.50...11.80 Rack travel mm Measurement Speed 1/min: 500 1st pressure hPa : 300 Rack travel in m: 12.10...12.30

Rack travel in m: 13.50...13.70 START CUT-OUT 1/min : 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 900 : 600 rom Del.quantity cm3/: 198.0...202.0 1000 s: (195.0...205.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500
Del.quantity cm3/: 131.0...133.0
1000 s: (128.0...136.0)
Spread cm3 : 8.00 1000 s: (12.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 12.30 rpm : 1090...1100 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 220.0...240.0 1000 s: (216.0...244.0) Remarks:

K26

2nd pressure hPa : 550

Note remarks

: MB 18,3 p : 07.02.89 Test sheet Edition : 26.8.88 Replaces : ISO-4113 Test oil

: 0 402 649 805 Combination no.

Injection pump

Pump designation : PE10P120A320LS7817

EP type number : 0 412 629 803

Governor

Governor design. : RQ300/1250PA856-1

: 0 421 801 449 Governer no.

Customer-spec. information

: DAIMLER-BENZ Customer

: 0M443 LA Engine

1st version kW : 400.0 : 2500 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 130...150

Test nozzle holder

: 1 688 901 019 assembly

Opening.

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

x Length mm : 6.00X1.50X1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10 : (3.95...4.15) Rack travel in mm : 20.00...21.00

: 10- 9- 4- 1- - 6- 3- 5-Firing order

: 0-45-72-117-144-189-Phasing

216-261-288-333

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 10

BASIC SETTING

rpm: 600 1st speed

Rack travel in mm : 15.50...15.70

Del.quantity cm3/: 22.4...22.6

100 s: (22.1...22.9)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm: 6.6...6.8 Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

cm3 : 0.6Spread

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2 rpm : 600 Speed

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600 Aneroid pressure h: 1050

Del.quantity : 224.0...229.0)

5.00 (9.00) Spread cm3

1000

RATED SPEED

1st version

Setting point:

: 600 Speed rpm

Rack travel in mm : 20.0 Testing: 1st rack travel in: 14.40 rpm : 1295...1310 Speed th rack travel in: 1500 Speed rom 2nd rack travel in: 4.00 LOW IDLE 1 Setting point w/out bumper spring : 300 man Rack travel in mm: 6.7 Testing: Speed : 200 rpm Minimum rack trave: 8.10 : 300 Speed rpm Rack travel in mm : 6.60...6.80 Rack travel in mm : 2.00 Speed rpm : 380...420 TORQUE CONTROL 2nd speed : 1250 rpm Rack travel in m: 15.40...15.60 rpm : 800 3rd speed Rack travel in m: 16.10...16.30 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rpm : 1050 hPa Pressure : 16.10...16.30 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : 400 Rack travel in m: 13.20...13.40
2nd pressure hPa : 750
Rack travel in m: 15.20...15.40
3rd pressure hPa : 1250
Rack travel in m: 16.20...16.40
4th pressure hPa : 1500 Rack travel in m: 16.60...16.80 5th pressure hPa : -Rack travel in m: 11.50...11.80 START CUT-OUT 1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: 1500 : 1250 Speed rpm Del.quantity cm3/: 222.0...226.0 1000 s: (219.0...229.0) cm3 : 8.00 1000 s: (12.0) Spread Aneroid pressure h: 1500 Speed rpm : 800 Del.quantity cm3/: 235.0...239.0 1000 s: (232.0...242.0) : 8.00 Spread cm3 1000 s: (12.0) Aneroid pressure h: -: 500 Speed rpm Del.quantity cm3/: 129.0...131.0 1000 s: (126.0...134.0) : 8.00 Spread cm3 1000 s: (12.0) **BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 14.40 Speed : 1295...1310 rpm

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity\_cm3/ : 230.0...250.0

1000 s: (226.0...254.0)

Remarks:

Note remarks

Test sheet : MAN 18,2 d1 : 07.02.89 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 402 649 807

Injection pump

Pump designation : PE10P120A520LS7811

EP type number : 0 412 629 802

Governor

Governor design. : RQV250...1150PA902 Governer no. : 0 421 813 720

Customer-spec. information : MAN Customer

: D 2840 LX Engine

1st version kW : 603.0 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Openina

: 207...210 pressure, bar

Orifice plate

: 0,8 diameter mm

Test lines : 1 680 750 067

Outside diameter x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.90...5.00 : (4.85...5.05) Rack travel in mm : 9.00...12.00 Firing order : 10- 9- 4- 1-- 6- 3- 5-

: 0-45-72-117-144-189-216-261-288-333 Phasing

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 10

BASIC SETTING

1st speed rpm: 1150

Rack travel in mm : 13.30...13.40

Del.quantity cm3/: 28.4...28.6

100 s: (28.1...28.9)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 500.0 2nd speed

Rack travel in mm : 8.7...8.9 Del.quantity cm3/ : 14.1...14.7

100 s: (13.8...15.0) Spread cm3 : 0.8

100 s: (1.2)

3rd speed rpm : 250 Rack travel in mm : 7.30...7.50 Del.quantity cm3/ : 5.3...6.0 \*\*

100 s: (-)

cm3 : Spread 100 s: (-)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 250 1st speed

1.10...1.50 travel mm

500 2nd speed rpm 3.80...4.20 travel mm

850 3rd speed rpm

travel mm

: 8.50...8.90 : 1150 4th speed rpm

travel mm : 9.50...9.70

: 1400 5th speed rpm

: 13.00...14.00 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 1200 Speed

L01

Rack travel in mm : 15.20...17.80 Speed 1/min : 200 (220) FULL LOAD DELIV. AT FULL LOAD STOP FUEL DELIVERY CHARACTERISTICS 1st version rpm : 1150 Speed 1st version Aneroid pressure h: 1300 Aneroid pressure h: -Del.quantity : 284.0...289.0) rpm\_ : 500 Speed Del.quantity cm3/: 149.0...151.0 1000 s: (146.0...154.0) cm3 : 5.00 Spread 1000 : (9.00) RATED SPEED BREAKAWAY 1st version 1st version Control lever 1mm rack travel less than position degrees: 79...87 full load rack tr: 12.30 rpm : 1190...1200 Testing: Speed 1st rack travel in: 12.30 rpm : 1190...1200 STARTING FUEL DELIVERY Speed 2nd rack travel in: 4.00 Speed rpm : 1345...1375 4th rack travel in: 1450 Speed rpm : 0.00...1.00 Speed rpm : 100 Del.quantity cm3/ : 100.0...120.0\*\* 1000 s: (-) LOW IDLE 1 Control lever HIGH IDLE position degrees: 18...26 1st version rpm : 500 \* Speed Testing: Rack travel in mm : 7.20...7.40 rpm : 100 Speed Del.quantity cm3/: -1000 s: (-) Minimum rack trave: 8.90 Speed rpm : 250
Rack travel in mm : 7.30...7.50
Rack travel in mm : 2.00 2nd version rpm : 430...490 rpm : 500 Speed Speed Rack travel in mm : 8.00...8.20 Del.quantity cm3/: 10.0...130.0 Aneroid/Altitude Compensator Test LOW IDLE 1st version rpm : 250 Rack travel in mm : 7.30...7..50 Del.quantity cm3/ : 52.0...60.0 \*\* 1000 s: (-) Settina : 500 Speed rpm hPa : 1300 Pressure : 13.30...13.40 Rack travel mm Remarks: Measurement 1/min: 500 Speed \* applies to cylinders 1, 2, 3, 7 and 9 \*\* applies for cylinders 4, 5, 6, 8 and 10 1st pressure hPa : -Rack travel in m: 8.90...9.10 2nd pressure hPa : 500 Rack travel in m: 9.30...9.40 **APPLICATION** 3rd pressure hPa : 1150 Rack travel in m: 11.80...12.20 Ship START CUT-OUT

Note remarks

: MB 18,3 L 2 : 07.02.89 Test sheet Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 402 649 808

Injection pump

Pump designation : PE10P120A320LS7809-1

EP type number : 0 412 629 801

Governor

Governor design. : RQ300/1050PA762-6

: 0 421 801 471 Governer no.

Customer-spec. information

Customer : DAIMLER-BENZ

: 0M443 A Engine

: 331.0 1st version kW : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 130...150

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

: 6.00X1.50X1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.00...4.10 Prestroke mm

: (3.95...4.15)

Rack travel in mm : 20.00...21.00 Firing order : 10- 9- 4- 1-- 6- 3- 5-

Phasing : 0-45-72-117-144-189-

216-261-288-333 Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 10

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 13.30...13.40

Del.quantity cm3/: 18.5...18.7

100 s: (18.2...19.0)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 300.02nd speed

Rack travel in mm : 6.6...6.8 Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6 100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

Speed rpm : 600 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1050 Speed Aneroid pressure h: 900

Aneroid F. Del.quantity 1000 : 185.0...187.0

: (182.0...190.0)

: 5.00 cm3 Spread

: (9.00) 1000

RATED SPEED

1st version

Setting point:

: 600 Speed rpm

Rack travel in mm : 20.0 Testing: 1st rack travel in: 12.30 rpm : 1090...1100 Speed 2nd rack travel in: 4.00 rpm : 1180...1210 Speed 4th rack travel in: 1250 rpm : 0.00...1.50Speed LOW IDLE 1 Setting point w/out bumper spring rpm : 300° Speed Rack travel in mm: 6.8 Testing: : 200 Speed rpm Minimum rack trave: 9.00 : 300 Speed rpm Rack travel in mm : 6.70...7.00 Rack travel in mm : 2.00 : 380...420 Speed rom TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version 1st speed rpm : 1050 Rack travel in m: 13.30...13.40 2nd speed rpm : 750 Rack travel in m: 14.20...14.40 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rpm Pressure hPa : -: 11.50...11.80 Rack travel mm Measurement 1/min: 500 Speed 1st pressure hPa : 300 Rack travel in m: 12.10...12.30 2nd pressure hPa : 550 Rack travel in m: 13.50...13.70 START CUT-OUT 1/min : 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 900 Speed rom

Del.quantity cm3/: 202.0...205.0 1000 s: (199.0...208.0) Spread cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 129.0...131.0 1000 s: (126.0...134.0) cm3 : 8.00Spread 1000 s: (-)

# **BREAKAWAY**

ist version 1mm rack travel less than

full load rack tr: 12.30 rpm : 1090...1100 Speed

STARTING FUEL DELIVERY

Speed : 100 rpm Del.quantity cm3/: 200.0...220.0 1000 s: (196.0...224.0)

Remarks:

104

Note remarks

Test sheet : MB 21,9 j 1 : 07.02.89 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 402 670 804

Injection pump

Pump designation : PE12P12OA32OLS7813-1

EP type number : 0 412 620 811

Governor

Governor design. : RSV350...750P0A825-5

Governer no. : 0 421 833 277

Customer-spec. information

: DAIMLER-BENZ Customer

Engine : OM 444 LA

1st version kW : 441.0 : 1500 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 150...170

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

x Lenath mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30

: (5.15...5.35)

Rack travel in mm : 19.00...21.00 Firing order : 12-1-5-9-8-3-4-11-10-2-6-7

: 0-45-60-105-120-165-Phasing

180-225-240-285-300-

345

: 0.50 (0.75) Tolerance + - 0

Time to cyl. no. : 12

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 15.90...16.00

Del.quantity cm3/: 26.7...26.9

100 s: (26.4...27.2)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 350.0 Rack travel in mm : 5.1...5.3 Del.quantity cm3/ : 1.4...2.0

100 s: (1.1...2.3)

cm3 : 0.8Spread

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3 008: man

Rack travel in mm : 0.30...1.40

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed

Speed Del.quantity 1000 : 267.0...269.0 : (264.0...272.0)

: 5.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 20...28

Testing:

1st rack travel in: 14.90 Speed rpm: 750...755 2nd rack travel in: 4.00 Speed rpm: 775...788 4th rack travel in: 900

rpm : 0.30...1.70Speed

LOW IDLE 1

Control Lever

position degrees: 9...17

Setting point w/out bumper spring

Speed rpm : 350
Rack travel in mm : 5.2
Speed rpm : 350
Rack travel in mm : 5.10...5.30

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 13.10

rpm : 750...755 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 240.0...260.0

1000 s: (236.0...264.0)

Remarks:

Observe VDT-I-420/120

**APPLICATION** 

Generator

Note remarks

Test sheet : MB 21,9 y 3 : 09.12.88 Edition Replaces : 8.6.88

Test oil : ISO-4113

: 0 402 670 806 Combination no.

Injection pump

Pump designation: PE12P12OA32OLS7807-2

EP type number : 0 412 620 812

Governor

Governor design. : RSV350..1050P0A538

: 0 421 833 300 Governer no.

Customer-spec. information

: DAIMLER-BENZ Customer

: OM 444 A Engine

: 390.0 : 2100 1st version kW Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 150...170

Test nozzle holder

: 1 688 901 019 assembly

Opening |

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

: 1 680 750 067 Test Lines

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 Prestroke mm

: (5.15...5.35) Rack travel in mm : 9.00...12.00

: 12- 1- 5- 9- 8- 3-4- 11- 10- 2- 6- 7 Firing order

Phasing : 0-45-60-105-120-165-

180-225-240-285-300-

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 12

BASIC SETTING

rpm : 10301st speed

Rack travel in mm : 12.40...12.50

Del.quantity cm3/: 17.2...17.4

100 s: (16.9...17.7)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 350.0 Rack travel in mm : 5.7...6.0 Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1030 Aneroid pressure h: 900

Anerote p. Del.quantity 1000 : 172.0...174.0

: (169.0...177.0)

: 5.00 cm3

1000

RATED SPEED

Spread

1st version Control lever position degrees: 36...44 Testina: 1st rack travel in: 11.40 Speed rpm : 1070...1080 2nd rack travel in: 4.00 rpm : 1130...1160 Speed 4th rack travel in: 1400 rpm : 0.30...1.40Speed LOW IDLE 1 Control lever position degrees: 13...21 Setting point w/out bumper spring rpm : 350 Speed Rack travel in mm : 5.8 Testing: : 100 Speed rpm Minimum rack trave: 9.50 : 350 Speed rpm Rack travel in mm : 5.70...6.00 SET IDLE AUXILIARY SPRING Rack travel in mm : 2.00 TORQUE CONTROL Torque control curve - 1st version rpm : 1030 1st speed Rack travel in m: 12.40...12.50 d speed rpm : 950 2nd speed Rack travel in m: 12.90...13.10 d speed rpm : 875 3rd speed Rack travel in m: 13.40...13.60 : 750 4th speed rpm Rack travel in m: 13.90...14.10 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rpm hPa : -Pressure : 10.60...10.90 Rack travel mm Measurement  $1/\min : 500$ Speed 1st pressure hPa : 300 Rack travel in m: 11.40...11.60 2nd pressure hPa : 500 Rack travel in m: 13.00...13.20

FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: 900 Speed rpm : 700
Del.quantity cm3/ : 206.0...210.0
1000 s: (203.0...213.0)
Spread cm3 : 8.00 1000 s: (12.0) Spread Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 136.0...138.0 1000 s: (133.0...141.0) cm3 : 8.00Spread 1000 s: (12.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.40 Speed rpm : 1070...1080

Speed rpm : 100 Del.quantity cm3/ : 220.0...240.0 1000 s: (216.0...244.0)

Remarks:

STARTING FUEL DELIVERY

L08

Note remarks

: SCA 9,0 k : 10.02.89 Test sheet Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 402 676 805

Injection pump

Pump designation : PE6P12OA32ORS7138 : 0 412 626 822 EP type number

Governor

Governor design. : RSV350...1100P1A512

: 0 421 833 196 Governer no.

Customer-spec. information

: SAAB-SCANIA Customer

: DS9 52,53,54,55 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.40...4.50 Prestroke mm

: (4.35...4.55)

Rack travel in mm : 9.00...12.00

L09

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 12.20...12.30

Del.quantity cm3/: 16.5...16.7

100 s: (16.2...17.0)

cm3 : 0.6Spread

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm: 4.5...4.9 Del.quantity cm3/: 2.0...2.4

100 s: (-)

cm3 : 0.3Spread

100 s: (0.6)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 6.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed

: 165.0...167.0 Del.quantity 1000 : (162.0...170.0)

: 6.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 62...70

Testing:

1st rack travel in: 11.20

rpm : 1140...1150 Speed

2nd rack travel in: 4.00

: 1200...1230 Speed rom

4th rack travel in: 1350 Speed rpm : 0.30...1.40

LOW IDLE 1 Control lever

position degrees: 26..384

Setting point w/out bumper spring

rpm Rack travel in mm : 4.1

Testing:

Speed rpm : 100 Minimum rack trave: 19.50 rpm : 350 Speed

Rack travel in mm : 4.50...4.70 Rack travel in mm : 2.00 : 445...505 Speed rpm

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1100

Del.quantity cm3/: 163.0...171.0 1000 s: (161.0...173.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.20

rpm : 1140...1150 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 270.0...320.0 Rack travel in mm : 20.00...21.00

LOW IDLE

: 350 rpm

Rack travel in mm : 4.50...4.70

Remarks:

Delivery-valve spring pre-tension 3.2...3.4 mm. Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring preload on new delivery-valve holders to 2.9...3.1 mm.

Start-of-delivery setting with ROBO

L10

diaphragm.

ADDITIONAL INFORMATION

For comb. with letter index see

VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania on 1988-09-12

Start of delivery - engine: 13° before

Firing sequence of engine: 1-5-3-6-2-4.

## Note remarks

: MB 14,7 g : 29.2.88 Test sheet Edition : 1.9.87 Replaces Test oil : ISO-4113

Combination no. : 0 402 678 802

Injection pump

Pump designation : PE8F12OA32OLS7801-1

EP type number : 0 412 628 818

Governor

Governor design. : RSV650...1050P0A826

: 0 421 833 253 Governer no.

Customer-spec. information

: DAIMLER-BENZ Customer

Engine : 0M442A

: 234.0 1st version kW : 2100 Rated speed : 234.0 2nd version kW : 2100 Rated speed

## TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 019 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0.8

Test Lines : 1 680 750 067

Outside diameter

x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 Prestroke mm

: (5.15...5.35)
Rack travel in mm : 9.00...12.00
Firing order : 8-7-2-6-3- 5-

: 0-45-90-135-180-225-Phasing

270-315

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm: 1080

Rack travel in mm : 11.60...11.70

Del.quantity cm3/: 16.3...16.5

100 s: (16.0...16.8)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 650.0 Rack travel in mm: 4.1...4.3 Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

cm3 : 0.8Spread

100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Rack travel in mm : 0.30...0.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 1080 Speed

Speed Del.quantity 1000 : 163.0...165.0 : (160.0...168.0)

: 5.00 : (9.00) Spread cm3

1000

RATED SPEED

1st version Control lever

position degrees: 34...42

Testing:

1st rack travel in: 10.60

rpm : 1110...1120 Speed

2nd rack travel in: 4.00

rpm : 1135...1150 Speed

4th rack travel in: 1400

Speed rpm : 0.30...1.40

LOW IDLE 1 Control lever

position degrees: 18...26

Setting point w/out bumper spring

Speed rpm : 650 Rack travel in mm : 4.2

Testing:

: 100 Speed rpm Minimum rack trave: 19.50 : 650 Speed rpm Rack travel in mm: 4.20 Rack travel in mm: 2.00

: 650...710 Speed rom

SET IDLE AUXILIARY SPRING rpm : 2.00 Speed

TORQUE CONTROL

Torque control curve - 1st version st speed rpm : 1080

Rack travel in m: 11.60...11.70

Ind speed rpm : 900

Rack travel in m: 43.00

1st speed

2nd speed

Rack travel in m: 13.20...13.40

3rd speed rpm : 1000

Rack travel in m: 12.40...12.60

FLEL DELIVERY CHARACTERISTICS

1st version

Speed : 900 rpm

Del.quantity cm3/: 202.0...206.0 1000 s: (199.0...209.0)

Spread

cm3 : 8.0 1000 s: (12.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 10.60

: 1110...1120 Speed rpm

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 200.0...220.0 1000 s: (196.0...224.0)

Engine-speed difference between 1 mm regulated and control-rod travel 4 mm = 25...35 1/min.

In order to adjust and test the EP combination, set full-load speed regul. at 1110...1120 1/min. Then set speed regul. to 1060...1070 1/min again.

Note remarks

Test sheet : MB 14,7 g 1 : 28.11.88 Edition : 2.11.87 Replaces : ISO-4113 Test oil

Combination no. : 0 402 678 803

Injection pump

Pump designation : PE8P120A320LS7801-1

EP type number : 0 412 628 818

Governor

Governor design: RSV350...750POA825-3

Governer no. : 0 421 833 260

Customer-spec. information

Customer : DAIMLER-BENZ

: 0M442A Engine

: 240.0 1st version kW Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 019 assembly

Opening

pressure, bar : 207...210

Orifice plate

: 0,8 diameter mm

: 1 680 750 067 Test lines

Outside diameter

x Wall thickness

: 6.00X1.50X1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 Prestroke mm

: (4.15...5.35)

Rack travel in mm : 9.00...12.00 Firing order : 8-7-2-6-3-5-

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

rpm: 700 1st speed

Rack travel in mm : 15.10...15.20

Del.quantity cm3/: 23.3...23.5

100 s: (23.0...23.8)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 350.0 Rack travel in mm : 5.2...5.4 Del.quantity cm3/ : 1.6...2.2 100 s: (1.3...2.5)

Spread

cm3 : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

: 233.0...235.0 Del.quantity 1000 : (230.0...238.0)

: 5.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 24...32

Testing:

1st rack travel in: 14.10 : 750...755 Speed man 2nd rack travel in: 4.00 : 775...788 Speed rpm 4th rack travel in: 900 rpm : 0.30...1.40 Speed LOW IDLE 1 Control lever position degrees: 10...18 Setting point w/out bumper spring : 350 rpm Rack travel in mm : 5.3 Testing: : 100 Speed rom Minimum rack trave: 15.00 : 350 rpm Rack travel in mm : 5.20...5.40 Rack travel in mm : 2.00 : 350...410 Speed rpm SET IDLE AUXILIARY SPRING Rack travel in mm: 2.00 TORQUE CONTROL : 900 2nd speed rpm Rack travel in m: 13.20...13.40 : 1000 3rd speed rpm Rack travel in m: 12.40...12.60 FUEL DELIVERY CHARACTERISTICS 1st version : 600 Speed rpm Del.quantity cm3/: 233.0...239.0 1000 s: (230.0...242.0) Spread cm3 : 8.00 1000 s: (12.0) STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 230.0...250.0 1000 s: (226.0...254.0) Remarks: APPLICATION Generator

270-315

: 0.50 (0.75)

: 0-45-90-135-180-225-

### BOSCH INJ. PUMP TEST SPECIFICATIONS

#### Note remarks

Test sheet : SCA 14,2 c2 : 07.02.89 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 402 678 807

Injection pump

Pump designation : PE8P120A920/4LS7002

EP type number : 0 412 628 800

Governor

Governor design. : RSV350...1000P1/484-

: 0 421 833 278 Governer no.

Customer-spec. information

Customer : SAAB-SCANIA

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0.8

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.00...5.10 : (4.95...5.15)

Rack travel in mm : 9.00...12.00 Firing order : 1-2-7-3-4-5-

Time to cyl. no. : 1

BASIC SETTING

Tolerance + - 0

Phasing

1st speed rpm: 700

Rack travel in mm : 13.20...13.30

Del.quantity cm3/: 18.7...18.9

100 s: (18.4...19.2)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 350.0 Rack travel in mm : 4.7...5.2 Del.quantity cm3/ : 1.4...1.8

100 s: (-)

cm3 : 0.3Spread

100 s: (0.6)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed

: 187.0...189.0 Del.quantity 1000 : (184.0...192.0)

: 6.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 55...63

Testing:

1st rack travel in: 12.20

rpm : 1040...1050 Speed

2nd rack travel in: 4.00

rpm : 1110...1140 Speed

L15

4th rack travel in: 1300

rpm : 0.30...1.70 Speed

LOW IDLE 1 Control Lever

position degrees: 25...33
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 4.3

Testing:

: 100 Speed rpm Minimum rack trave: 19.50 : 350 Speed rom

Rack travel in mm : 4.70...4.90

Rack travel in mm : 2.00 rpm : 440...500 Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1000 Del.quantity cm3/ : 184.0...192.0 1000 s: (182.0...194.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 12.20

rpm : 1040...1050 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 240.0...290.0 Rack travel in mm : 20.00...21.00

LOW IDLE

: 350 rpm

Rack travel in mm : 4.70...4.90

Remarks:

: DS14 06,07 : DS14 40,42 : DSI14 40,41

Delivery-valve spring pre-tension 3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring preload on new delivery-valve holders to 2.9...3.1 mm.

Start-of-delivery setting with ROBO diaphragm.

ADDITIONAL INFORMATION

For comb. with letter index see VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania on 1988-09-21

Start of delivery - engine: DS 14 - 18° before TDC DSI 14 - 17° before TDC

Engine firing sequence: 1-5-4-2-6-3-7-8

Note remarks

Test sheet : SCA 14,0 i : 07.02.89 Edition

Replaces Test oil : ISO-4113

: 0 402 678 811 Combination no.

Injection pump

Pump designation: PE8P12OA92O/4LS7125

EP type number : 0 412 628 833

Governor

Governor design. : RSV350...1050P1A512-

: 0 421 833 306 Governer no.

Customer-spec. information

: SAAB-SCANIA Customer

: DS 14 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 019

Openina

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

: 1 680 750 015 Test lines

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27

: 5.00...5.10 Prestroke mm

: (4.95...5.15)

Rack travel in mm : 9.00...12.00 Firing order : 1- 2- 7- 3- 4- 5-6- 8

: 0-45-90-135-180-225-Phasing

270-315

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no.

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 13.50...13.60

Del.quantity cm3/: 21.4...21.6

100 s: (21.1...21.9)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 350.0 Rack travel in mm : 4.6...5.0 Del.quantity cm3/: 1.5...1.9

100 s: (-) cm3 : 0.3Spread

100 s: (0.6)

GUIDE SLEEVE POSITION Control-Lever position Degree: -3

Speed rpm: 800 Rack travel in mm: 0.30...0.70

Governor spring pre-tension Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

: 214.0...216.0 Del.quantity 1000 : (211.0...219.0)

cm3 : 6.00 Spread

1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 44...52

Testing:

1st rack travel in: 12.50

rpm : 1090...1100 Speed

L17

2nd rack travel in: 4.00

Speed rpm: 1115...1145 4th rack travel in: 1280

rpm : 0.30...1.40 Speed

LOW IDLE 1 Control Lever

position degrees: 14...22

Setting point w/out bumper spring

rpm : 350 Rack travel in mm: 4.2

Testing:

rpm : 100 Speed Minimum rack trave: 19.50 rpm : 350 Speed

Rack travel in mm : 4.60...4.80 Rack travel in mm : 2.00

: 430...490 Speed rpm

FUEL DELIVERY CHARACTERISTICS

1st version

: 950 Speed rom

Del.quantity cm3/: 203.0...211.0 1000 s: (201.0...213.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 12.50

rpm : 1090...1100 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 240.0...290.0 1000 s: (-) Rack travel in mm: 20.00...21.00

LOW IDLE

Speed rpm : 350

Rack travel in mm : 4.60...4.80

Remarks:

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring preload on new delivery-valve holders to 2.9...3.1 mm.

Start-of-delivery setting with ROBO diaphragm.

ADDITIONAL INFORMATION

For comb. with letter index see VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania on November 28, 1988

Engine firing sequence: 1-5-4-2-6-3-7-8

Note remarks

Test sheet : MAC 11,1a11 : 10.02.89 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 402 736 800

Injection pump

Pump designation : PES6P120A720/3RS7135

EP type number

: 0 412 726 818

Governor

Governor design. : RQV325..1050PA848-

20K

: 0 421 815 203 Governer no.

Customer-spec. information Customer : MACK

: EM6 300 2VH Engine

1st version kW : 224.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 011

Inlet press., bar: 1.50

Test nozzle holder

: 9 688 901 101 assembly

Openina (

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter

x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

: 2.75...2.85 Prestroke mm

: (2.70...2.90)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Phasing

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1050

Rack travel in mm : 12.90...13.00

Del.quantity cm3/: 19.9...20.1

100 s: (19.6...20.4)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 325.0 2nd speed

Rack travel in mm : 4.8...5.0 Del.quantity cm3/: 3.8...4.4

100 s: (3.6...4.6)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

: 1.40...1.60 travel mm rpm : 450 2nd speed

: 2.50...2.80 travel mm

: 800 3rd speed mqn

: 4.80...5.00 travel mm

: 1050 4th speed rpm

: 7.30...7.60 travel mm

5th speed : 1200 rpm

travel mm : 9.40...9.60

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 1200 Speed

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1050 Speed Aneroid pressure h: 900 : 199.0...201.0 Del.quantity 1000 : (196.0...204.0) : 5.00 cm3 Spread 1000 : (9.00) RATED SPEED 1st version Control Lever position degrees: 56...64 Testing: 1st rack travel in: 11.90 rpm : 1090...1100 Speed 2nd rack travel in: 4.00 rpm : 1170...1200 Speed 4th rack travel in: 1300 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 10...18 Testing: : 275 Speed rpm Minimum rack trave: 6.30 : 325 Speed rpm Rack travel in mm : 4.80...5.00 CONSTANT REGULATION rpm : 325...600 Speed TORQUE CONTROL Torque control curve - 1st version rpm : 1050 1st speed Rack travel in m: 12.90...13.00 nd speed rpm : 630 Rack travel in m: 13.00...13.10 2nd speed 3rd speed rpm : 500 Rack travel in m: 0.00...12.60 Aneroid/Altitude Compensator Test 1st version Setting : 630 Speed rpm hPa : 900 Pressure Rack travel mm : 13.00...13.10 Measurement 1/min: 630 Speed

3rd pressure hPa : 410 Rack travel in m: 11.40...11.80 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 900 Speed rpm : 630
Del.quantity cm3/ : 213.0...219.0
1000 s: (210.0...222.0) cm3 : 8.00 1000 s: (12.0) Spread Aneroid pressure h: rpm : 400 Speed Del.quantity cm3/: 121.0...125.0 1000 s: (119.0...127.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.90 rpm : 1090...1100 Speed STARTING FUEL DELIVERY Speed rpm Del.quantity cm3/: 110.0...150.0 1000 s: (100.0...160.0) Rack travel in mm : 7.80...8.20 LOW IDLE rpm : 325 Speed Rack travel in mm : 4.80...5.00 Del.quantity cm3/: 38.0...44.0 1000 s: (36.0...46.0) Spread cm3 : 8.001000 s: (12.00) Remarks: Delivery-valve spring pre-tension 3.0...3.2 mm. **APPLICATION** 

Omnibus

1st pressure hPa : -

Rack travel in m: 7.80...8.20 2nd pressure hPa : 190 Rack travel in m: 9.10...9.20

Note remarks

Test sheet : MB 10,0 o : 03.03.89 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 402 745 806

Injection pump

Pump designation : PES5P120A720LS7163

: 0 412 725 803 EP type number

Governor

Governor design. : RQ300/1050PA774-4

: 0 421 801 453 Governer no.

Customer-spec. information

: DAIMLER-BENZ Customer

: 0M429 LA Engine

1st version kW : 221.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 019 assembly

Opening

pressure, bar : 207...210

Orifice plate

: 0,8 diameter mm

: 1 680 750 067 Test lines

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30 : (5.15...5.35) Rack travel in mm : 20.00...21.00

Firing order : 1-3-5-4-2

Phasing : 0-72-144-216-288

Tolerance  $+ - \circ : 0.50 (0.75)$ 

Time to cyl. no. : 5

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 13.60...13.80

Del.quantity cm3/: 23.5...23.7

100 s: (23.2...24.0)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 300.02nd speed Rack travel in mm : 5.6...5.9 Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.8100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2 rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 600 Speed Aneroid pressure h: 800

: 235.0...237.0 Del.quantity 1000 : (232.0...240.0)

: 5.00 cm3 Spread

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed : 600 rom Rack travel in mm : 20.0

Testing: 1st rack travel in: 12.00 Speed rpm : 1095...1110 2nd rack travel in: 4.00 rpm : 1160...1190 Speed 4th rack travel in: 1300 Speed rpm : 0.00...1.50 LOW IDLE 1 Setting point w/out bumper spring rpm Rack travel in mm: 5.7 Testing: Speed rpm : 200 Minimum rack trave: 7.60 Speed rpm : 300
Rack travel in mm : 5.60...5.90
Rack travel in mm : 2.00 : 370...410 Speed rpm TORQUE CONTROL Dimension a mm Torque control curve - 1st version rpm : 1050 1st speed Rack travel in m: 13.00...13.20 rpm : 750 2nd speed Rack travel in m: 14.40...14.60 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rpm hPa : 800 Pressure : 13.60...13.80 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : 200 Rack travel in m: 11.00...11.20 2nd pressure hPa : 450
Rack travel in m: 13.00...13.20
3rd pressure hPa : 1000
Rack travel in m: 13.70...13.80
4th pressure hPa : 1400 Rack travel in m: 14.40...14.60 5th pressure hPa : Rack travel in m: 10.00...10.40 START CUT-OUT 1/min: 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: 1400 : 1050 Speed rpm Del.quantity cm3/: 228.0...231.0 1000 s: (225.0...234.0) Spread : 8.00 cm3 1000 s: (12.0) Aneroid pressure h: 1400 : 750 Speed rpm Del.quantity cm3/: 250.0...254.0 1000 s: (247.0...257.0) Spread cm3 : 8.00 1000 s: (12.0) : 500 Speed rpm Del.quantity cm3/: 146.0...148.0 1000 s: (143.0...151.0) cm3 : 8.00 Spread 1000 s: (12.00

# **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 12.00 Speed rpm : 1095...1110

### STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 220.0...240.0 1000 s: (216.0...244.0)

### Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MAC 11,1 a : 07.02.89 : 7.10.88 Edition Replaces Test oil : ISO-4113 : 0 402 746 810 Combination no. Injection pump Pump designation : PES6P120A720RS7135 EP type number : 0 412 726 807 Governor Governor design. : RQV325...900PA848K : 0 421 815 168 Governer no. Customer-spec. information Customer : MACK : E6-350 4VH Engine : 261.0 1st version kW : 1800 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 2 417 413 011 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 101 assembly Opening : 207...210 pressure, bar Orifice plate diameter mm : 0,6 Test lines : 1 680 750 008 Outside diameter x Wall thickness x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 17...19 L23

Prestroke mm : 2.75...2.85 : (2.70...2.90) Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4 Firing order : 0-60-120-180-240-300 Phasing Tolerance + - 0 : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 900 Rack travel in mm : 13.90...14.00 Del.quantity cm3/: 23.6...23.8 100 s: (23.3...24.1) Spread cm3 : 0.5100 s: (0.9) rpm : 325.0 2nd speed Rack travel in mm: 4.0...4.2 Del.quantity cm3/: 3.2...3.8 100 s: (3.0...4.0) cm3 : 0.8Spread 100 s: (1.2) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 325 1st speed 1.20...1.40 travel mm 2nd speed : 450 rpm 3.10...3.30 travel mm 850 3rd speed rpm travel mm 5.90...6.10 1000 4th speed rpm : 7.50...7.70 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1130 Speed Rack travel in mm : 7.00...13.00 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 900 Speed Aneroid pressure h: 900 Del.quantity : 236.5...238.5 1000 : (233.5...241.5)

Spread cm3 : 5.00 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 53...61 Testing: 1st rack travel in: 12.90 Speed rpm : 950...960 2nd rack travel in: 4.00 rpm : 1075...1105 Speed 4th rack travel in: 1250 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 7...15 Testing: Speed rpm : 275 Minimum rack trave: 5.50 : 325 rom Rack travel in mm : 4.00...4.20 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm rpm : 900 1st speed Rack travel in m: 13.90...14.00 2nd speed rpm : 625 Rack travel in m: 14.10...14.20 3rd speed rpm : 800 Rack travel in m: 14.00...14.10 4th speed rpm : 500 Rack travel in m: 0.00...13.50 Aneroid/Altitude Compensator Test 1st version Setting Speed man : 625 hPa : 900 Pressure : 14.10...14.20 Rack travel mm Measurement

Torque control curve - 1st version 1/min: 625 Speed 1st pressure hPa : -Rack travel in m: 8.50...8.90
2nd pressure hPa : 275
Rack travel in m: 10.00...10.10

Rack travel in m: 12.30...12.70 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 900 : 625 Speed rpm Del.quantity cm3/: 257.0...263.0 1000 s: (254.0...266.0) Spread cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: -: 400 Speed rpm Del.quantity cm3/: 142.0...146.0 1000 s: (140.0...148.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 12.90 rpm : 950...960 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 170.0...210.0 1000 s: (160.0...220.0) Rack travel in mm : 8.50...8.90 LOW IDLE Speed rpm : 325
Rack travel in mm : 4.00...4.20 Del.quantity cm3/: 32.0...38.0 1000 s: (30.0...40.0)

cm3 : 8.00 Spread 1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension 3.0...3.2 mm.

3rd pressure hPa : 570

Note remarks

: MAC 11,1 a1 : 07.02.89 Test sheet Edition Replaces : 8.4.88 Test oil : ISO-4113

: 0 402 746 814 Combination no.

Injection pump

Pump designation : PES6P120A720RS7135 EP type number : 0 412 726 807

Governor

Governor design. : RQV325...850PA848-1K

: 0 421 815 169 Governer no.

Customer-spec, information Customer : MACK

: E6-300 4VH Engine

1st version kW : 224.0 : 1900 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 011

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

: 2,75...2.85 Prestroke mm

Rack travel in mm :

: (2.70...2.90) : 9.00...12.00 : 1- 5- 3- 6- 2- 4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 12.90...13.00

Del.quantity cm3/: 20.0...20.2

100 s: (19.7...20.5)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 325.0 2nd speed Rack travel in mm : 4.5...4.7 Del.quantity cm3/ : 3.2...3.8 100 s: (3.0...4.0)

cm3 : 0.8Spread

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

: 1.20...1.40 travel mm

2nd speed : 450 rpm

travel mm : 2.80...3.10

3rd speed : 850 rpm

: 6.20...6.40 travel mm

1000 4th speed rpm

: 7.70...7.90 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1100

Speed Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 850 Speed

Aneroid pressure h: 900 Aneroid Deliquantity
1000

: 200.5...202.5

: (197.5...205.5)

: 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 52...60 Testing: 1st rack travel in: 11.90 Speed rpm : 900...910 2nd rack travel in: 4.00 rpm : 1025...1055 Speed 4th rack travel in: 1100 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 7...15 Testing: : 275 Speed rpm Minimum rack trave: 6.00 Speed rpm : 325 Rack travel in mm : 4.50...4.70 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version rpm : 850 1st speed Rack travel in m: 12.90...13.00

2nd speed rpm : 700

Rack travel in m: 13.30...13.50

3rd speed rpm : 600

Rack travel in m: 13.50...13.70

4th speed rpm : 500

Rack travel in m: 0.00...13.10 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rpm hPa : 900 Pressure : 13.50...13.70 Rack travel mm Measurement  $1/\min : 600$ Speed 1st pressure hPa : -Rack travel in m: 9.90...10.30 2nd pressure hPa : 250 Rack travel in m: 10.90...11.00 3rd pressure hPa : 475

Rack travel in m: 12.60...13.00 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 900 Speed rpm : 700 Del.quantity cm3/ : 217.0...223.0 1000 s: (214.0...226.0) Aneroid pressure h: 900 Speed rpm : 600 Del.quantity cm3/ : 233.0...239.0 1000 s: (230.0...242.0) Spread cm3 : 8.001000 s: (12.0) Aneroid pressure h: -Speed rpm : 400 Del.quantity cm3/: 154.0...158.0 1000 s: (152.0...160.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 11.90 rpm : 900...910 Speed STARTING FUEL DELIVERY Speed : 100 rpm Del.quantity cm3/: 195.0...235.0 1000 s: (185.0...245.0) Rack travel in mm: 9.90...10.30 LOW IDLE Speed rpm : 325 Rack travel in mm : 4.50...4.70 Del.quantity cm3/: 32.0...38.0 1000 s: (30.0...40.0) cm3 : 8.00Spread 1000 s: (12.00) Remarks: Delivery-valve spring pre-tension 3.0...3.2 mm.

Note remarks

: MAC 11,1 a2 : 07.02.89 : 7.10.88 Test sheet Edition Replaces : ISO-4113 Test oil

: 0 402 746 815 Combination no.

Injection pump

: PES6P120A720RS7135 Pump designation

: 0 412 726 807 EP type number

Governor

Governor design. : RQV325...850PA848-2K

: 0 421 815 170 Governer no.

Customer-spec. information : MACK Customer

: E6-275 4VH Engine

: 202.0 1st version kW Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 011

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85

: (2.70...2.90)
Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 850 1st speed

Rack travel in mm : 12.00...12.10

Del.quantity cm3/: 18.1...18.3

100 s: (17.8...18.6)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 325.02nd speed Rack travel in mm : 4.5...4.7 Del.quantity cm3/: 3.2...3.8

100 s: (3.0...4.0)

Spread cm3 : 0.8100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 325 1st speed

: 1.20...1.40 travel mm

: 450 2nd speed rpm

travel mm : 2.80...3.10

: 850 3rd speed rpm

: 6.20...6.40 travel mm

: 1000 4th speed man

: 7.70...7.90 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm: 1110 Rack travel in mm: 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 850 Speed Aneroid pressure h: 900

Del.quantity : 181.0...186.0)

Spread cm3 : 5.00

1000 : (9.00)

### RATED SPEED

1st version Control lever

position degrees: 52...60

Testing:

1st rack travel in: 11.00 rpm : 900...910 Speed 2nd rack travel in: 4.00

rom : 1025...1055 Speed

4th rack travel in: 1150

rpm : 0.00...1.00Speed

LOW IDLE 1 Control lever

position degrees: 7...15

Testing:

: 275 Speed rpm Minimum rack trave: 6.00 : 325 Speed rom

Rack travel in mm : 4.50...4.70

CONSTANT REGULATION

rpm : 325...520 Speed

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

1st speed rpm : 850

Rack travel in m: 12.00...12.10

2nd speed rpm : 600

Rack travel in m: 12.60...12.70

3rd speed rpm : 700

Rack travel in m: 12.50...12.70

4th speed rpm : 500

Rack travel in m: 0.00...12.40

Aneroid/Altitude Compensator Test

1st version

Settina

: 600 Speed rpm hPa : 900 Pressure

: 12.60...12.70 Rack travel mm

Measurement

1/min: 600 Speed

1st pressure hPa : -

Rack travel in m: 9.50...9.90

2nd pressure hPa : 215

Rack travel in m: 10.30...10.40

3rd pressure hPa : 360

Rack travel in m: 11.50...11.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 600 Del.quantity cm3/ : 210.5...216.5 1000 s: (207.5...219.5)

cm3 : 8.00 1000 s: (12.0) Spread

Aneroid pressure h: -

rpm : 400 Speed

Del.quantity cm3/: 144.0...148.0 1000 s: (142.0...150.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.00

rpm : 900...910 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 160.0...200.0 1000 s: (150.0...210.0)

Rack travel in mm : 9.50...9.90

LOW IDLE

rpm : 325

Rack travel in mm : 4.50...4.70 Del.quantity cm3/: 32.0...38.0 1000 s: (30.0...40.0)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension

3.0...3.2 mm.

Note remarks

: MAC 11,1 a3 : 07.02.89 : 7.10.88 Test sheet Edition Replaces Test oil : ISO-4113

Combination no. : 0 402 746 816

Injection pump

Pump designation : PES6P120A720RS7135

: 0 412 726 807 EP type number

Governor

Governor design. : RQV325...875PA848-3K

: 0 421 815 171 Governer no.

Customer-spec. information Customer : MACK

: EM6-250L 4VH Engine

: 186.0 1st version kW : 1950 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 011

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Openi/a

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85 : (2.70...2.90) Rack travel in mm : 9.00...12.00

: 1-5-3-6-2- 4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 875 1st speed

Rack travel in mm : 10.80...10.90

Del.quantity cm3/: 16.3...16.5

100 s: (16.0...16.8)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 325.0 2nd speed

Rack travel in mm : 4.5...4.7 Del.quantity cm3/: 3.9...4.5 100 s: (3.7...4.7)

cm3 : 0.8 Spread

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 325 : 1.20...1.40 1st speed travel mm

rpm : 450 2nd speed

: 2.80...3.20 travel mm : 850 3rd speed rom

: 6.20...6.40 travel mm

4th speed : 1000 rom

travel mm : 7.70...7.90

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 Speed rpm : 1100 Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 875 Speed

Aneroid pressure h: 1200 Del.quantity : 163.0...165.0 1000 : (160.0...168.0)

cm3 : 5.00 1000 : (9.00) Spread RATED SPEED 1st version Control lever position degrees: 52...60 Testing: 1st rack travel in: 9.80 Speed rpm : 925...935 2nd rack travel in: 4.00 rpm : 1010...1040 Speed 4th rack travel in: 1100 Speed rpm : 0.00...1.00LOW IDLE 1 Control lever position degrees: 9...17 Testing: Speed : 275 rpm Minimum rack trave: 6.00 Speed : 325 rpm Rack travel in mm : 4.50...4.70 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version rpm : 875 1st speed Rack travel in m: 10.80...10.90 nd speed rpm : 510 Rack travel in m: 13.00...13.20 2nd speed 3rd speed rpm : 700
Rack travel in m: 11.60...11.80
4th speed rpm : 550
Rack travel in m: 0.00...13.10 Aneroid/Altitude Compensator Test 1st version Setting Speed rpm : 510 Pressure hPa : 1200 Rack travel mm : 13.00...13.20 Measurement 1/min: 510 Speed 1st pressure hPa : Rack travel in m: 8.60...9.00
2nd pressure hPa : 215
Rack travel in m: 10.30...10.40
3rd pressure hPa : 435

Rack travel in m: 12.20...12.60 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 Speed : 510 rpm Del.quantity cm3/: 240.0...246.0 1000 s: (237.0...249.0) cm3 : 8.00 1000 s: (12.0) Spread Aneroid pressure h: -: 400 Speed rpm Del.quantity cm3/: 146.0...150.0 1000 s: (144.0...152.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 9.80 rpm : 925...935 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 145.0...185.0 1000 s: (135.0...195.0) Rack travel in mm : 8.60...9.00 LOW IDLE Speed rpm : 325 Rack travel in mm : 4.50...4.70 Del.quantity cm3/: 39.0...45.0 1000 s: (37.0...47.0) Spread cm3 : 8.001000 s: (12.00) Remarks: Delivery-valve spring pre-tension 3.0...3.2 mm.

MO2

Note remarks

Test sheet : MAC 11,1 a4 Edition : 07.02.89 : 7.10.88 Replaces Test oil : ISO-4113

: 0 402 746 817 Combination no.

Injection pump

Pump designation : PES6P120A72ORS7135

EP type number : 0 412 726 807

Governor

Governor design. : RQV325...900PA848-4K

: 0 421 815 173 Governer no.

Customer-spec. information Customer : MACK

: EC6-350 4VH Engine

: 261.0 1st version kW : 1900 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 011

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0.8

: 1 680 750 008 Test lines

Outside diameter x Wall thickness

: 6.00x2.00x600 x Lenath mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

: 2.75...2.85 : (2.70...2.90) Prestroke mm

Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4 Firing order

Phasina : 0-60-120-180-240-300

: 0.50 (0.75) Tolerance + - 0

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 900

Rack travel in mm : 14.60...14.70

Del.quantity cm3/: 24.1...24.3

100 s: (23.8...24.6)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 325.0 2nd speed

Rack travel in mm : 4.9...5.1 Del.quantity cm3/ : 3.9...4.5 100 s: (3.7...4.7)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed

rpm : 325 : 1.20...1.40 travel mm

: 450 2nd speed rpm

: 3.10...3.30 travel mm

3rd speed : 850 rpm

: 5.90...6.10 travel mm

: 1000 4th speed rpm

: 7.50...7.70 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 Speed rpm : 1130 Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900 Aneroid pressure h: 1200

Del.quantity : 241.5...246.5)

cm3 : 5.00 Spread 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 53...61

Testing:

1st rack travel in: 13.60 Speed rpm : 950...960 2nd rack travel in: 4.00 rpm : 1090...1120 Speed

4th rack travel in: 1200

rpm : 0.00...1.00Speed

LOW IDLE 1 Control lever

position degrees: 7...15

Testing:

Speed : 275 rpm Minimum rack trave: 6.44 : 325 Speed rpm

Rack travel in mm : 4.90...5.10

CONSTANT REGULATION

rpm : 325...520 Speed

TORQUE CONTROL

Dimension a mm Torque control curve - 1st version

rpm : 900 1st speed

Rack travel in m: 14.60...14.70 rpm : 625 2nd speed

Rack travel in m: 14.90...15.10

rpm : 800 3rd speed

Rack travel in m: 14.70...14.80

4th speed rpm : 500

Rack travel in m: 0.00...14.50

Aneroid/Altitude Compensator Test

1st version Setting

Speed : 625 rpm hPa : 1200 Pressure

: 14.90...15.10 Rack travel mm

Measurement

1/min: 625 Speed

1st pressure hPa : -

Rack travel in m: 8.10...8.50
2nd pressure hPa : 280
Rack travel in m: 10.40...10.50

3rd pressure hPa : 650

Rack travel in m: 13.30...13.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200 : 625 Speed rpm

Del.quantity cm3/: 265.0...271.0 1000 s: (262.0...274.0)

cm3 : 8.00 1000 s: (12.0) Spread

Aneroid pressure h: -: 400 Speed rpm

Del.quantity cm3/: 130.5...134.5

1000 s: (128.5...136.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.60

rpm : 950...960 Speed

STARTING FUEL DELIVERY

Speed : 100 rpm

Del.quantity cm3/: 120.0...160.0 1000 s: (110.0...170.0) Rack travel in mm: 8.10...8.50

LOW IDLE

rpm : 325 Speed

Rack travel in mm : 4.90...5.10

Del.quantity cm3/: 39.0...45.0

1000 s: (37.0...47.0)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension 3.0...3.2 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : MAC 11,1 a5 : 07.02.89 Test sheet Edition : 7.10.88 Replaces : ISO-4113 Test oil : 0 402 746 818 Combination no. Injection pump Pump designation : PES6P120A720RS7135 EP type number : 0 412 726 807 Governor : RQV325...875PA848-5K Governor design. Governer no. : 0 421 815 174 Customer—spec. information Customer : MACK : EM6-275L 4VH Engine : 202.0 1st version kW Rated speed : 1950 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 2 417 413 011 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 101 assembly Opening : 207...210 pressure, bar Orifice plate diameter mm : 0,8 Test lines : 1 680 750 008 Outside diameter

x Wall thickness x Length mm : 6.00X2.00X600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY Test pressure, bar: 17...19 M05

: 2.75...2.85 : (2.70...2.90) Prestroke mm Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 Phasing : 0-60-120-180-240-300 Tolerance + - 0 : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 875 Rack travel in mm : 12.20...12.30 Del.quantity cm3/: 19.0...19.2 100 s: (18.7...19.5) Spread cm3 : 0.5100 s: (0.9) 2nd speed rpm : 325.0 Rack travel in mm : 4.6...4.8 Del.quantity cm3/ : 3.7...4.3 100 s: (3.5...4.5) cm3 : 0.8 Spread 100 s: (1.2) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 325 : 1.20...1.40 1st speed travel mm rpm : 450 2nd speed : 2.80...3.10 travel mm : 850 3rd speed rpm : 6.20...6.40 travel mm : 1000 4th speed rom : 7.70...7.90 travel mm

GUIDE SLEEVE POSITION

Control-lever position Degree: -1 Speed rpm : 1110 Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version Speed rbm : 875 Aneroid pressure h: 1200 Del.quantity : 190.0...195.0)

: 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control Lever position degrees: 52...60 Testing: 1st rack travel in: 11.20 Speed rpm: 925...935 2nd rack travel in: 4.00 rpm : 1030...1060 Speed 4th rack travel in: 1150 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 9...17 Testing: Speed rpm Minimum rack trave: 6.10 : 325 rpm Rack travel in mm : 4.60...4.80 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 875 Rack travel in m: 12.20...12.30 2nd speed rpm : 510 Rack travel in m: 14.10...14.30 3rd speed rpm : 700 Rack travel in m: 13.20...13.40 4th speed rpm : 400 Rack travel in m: 0.00...13.80 Aneroid/Altitude Compensator Test 1st version Settina pm : 510 hPa : 1200 Speed rpm Pressure Rack travel mm : 14.10...14.30 Measurement 1/min: 510 Speed 1st pressure hPa :-

Rack travel in m: 9.40...9.60 2nd pressure hPa : 280 Rack travel in m: 10.60...10.70

3rd pressure hPa : 485

Rack travel in m: 12.70...13.30 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 Speed rpm Del.quantity cm3/: 262.5...268.5 1000 s: (259.5...271.5) cm3 : 8.00 1000 s: (12.0) Spread Aneroid pressure h: rpm : 400 Speed Del.quantity cm3/: 145.0...149.0 1000 s: (143.0...151.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 11.20 rpm : 925...935 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 170.0...210.0 1000 s: (160.0...220.0) Rack travel in mm : 9.40...9.60 LOW IDLE Speed rpm : 325
Rack travel in mm : 4.60...4.80
Del.quantity cm3/ : 37.0...43.0
1000 s: (35.0...45.0) cm3 : 8.00 Spread 1000 s: (12.00) Remarks: Delivery-valve spring pre-tension 3.0...3.2 mm.

Note remarks

Test sheet : MAC 11,1 a6 : 07.02.89 Edition : 7.10.88 Replaces : ISO-4113 Test oil

: 0 402 746 819 Combination no.

Injection pump

Pump designation : PES6P120A720RS7135

: 0 412 726 807 EP type number

Governor

Governor design. : RQV325...875PA848-6K

: 0 421 815 175 Governer no.

Customer-spec. information Customer : MACK

: EM6-225L 4VH Engine

1st version kW : 165.0 Rated speed : 1950

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 011

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter

x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85 : (2.70...2.90) Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4

Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 875

Rack travel in mm : 11.00...11.10

Del.quantity cm3/: 15.8...16.0

100 s: (15.5...16.3)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.6...4.8

Del.quantity cm3/: 3.8...4.4 100 s: (3.6...4.6) Spread cm3 : 0.8 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

: 1.20...1.40 travel mm : 450

2nd speed rom 2.80...3.10 travel mm

: 850 3rd speed man

: 6.20...6.40 travel mm

: 1000 4th speed rpm

: 7.70...7.90 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm: 1110
Rack travel in mm: 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 900

Del.quantity : 130.3...163.5)

cm3 : 5.00 Spread 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 52...60 Testing: 1st rack travel in: 10.00 Speed rpm : 925...935 2nd rack travel in: 4.00 Speed rpm : 1015...1045 4th rack travel in: 1150 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 9...17 Testing: Speed : 275 rpm Minimum rack trave: 6.10 rpm : 325 Rack travel in mm : 4.60...4.80 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version rpm : 875 1st speed Rack travel in m: 11.00...11.10 rpm : 510 2nd speed Rack travel in m: 13.20...13.40 rpm : 600 3rd speed Rack travel in m: 12.50...12.70 4th speed rpm : 700 Rack travel in m: 11.80...12.00 5th speed rpm : 350 Rack travel in m: 0.00...13.20 Aneroid/Altitude Compensator Test 1st version Setting rpm : 510 hPa : 900 Speed rpm Pressure Rack travel mm : 13.20...13.40 Measurement 1/min: 510 Speed 1st pressure hPa : -Rack travel in m: 8.50...8.90 2nd pressure hPa : 220

Rack travel in m: 9.70...9.80 3rd pressure hPa : 500 Rack travel in m: 12.00...12.40

FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: 900 Speed rpm

Del.quantity cm3/: 234.0...240.0 1000 s: (231.0...243.0)

cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: -

: 400 Speed rpm

Del.quantity cm3/: 131.0...135.0

1000 s: (129.0...137.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 10 00 Speed rpm : 925...935

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 135.0...175.0 1000 s: (125.0...185.0)

Rack travel in mm : 8.50...8.90

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.60...4.80
Del.quantity cm3/ : 38.0...44.0
1000 s: (36.0...46.0)

cm3 : 8.00

Spread 1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension 3.0...3.2 mm.

**80M** 

Note remarks

Test sheet : MAC 11,1 b5 : 07.02.89 Edition : 7.10.88 Replaces : ISO-4113 Test oil

Combination no. : 0 402 746 820

Injection pump

Pump designation : PES6P12OA72ORS7135

: 0 412 726 807 EP type number

Governor

Governor design. : RQV325...850PA878K

Governer no. : 0 421 815 177

Customer-spec. information Customer : MACK

Engine : E6-275 4VH

: 202.0 1st version kW : 1900 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 011

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Openina

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

: 1 680 750 008 Test lines

Outside diameter x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85 : (2.70...2.90)
Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 850

Rack travel in mm : 12.00...12.10

Del.quantity cm3/: 18.1...18.3

100 s: (17.8...18.6)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 325.02nd speed Rack travel in mm: 4.5...4.7 Del.quantity cm3/: 3.2...3.8 100 s: (3.0...4.0)

cm3 : 0.8Spread

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

: 1.20...1.40 travel mm

2nd speed : 450 rpm

travel mm : 2.80...3.10

3rd speed : 850 rpm

: 6.20...6.40 travel mm

1000

rpm : 7.70...7.90 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1110 Speed

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

4th speed

Speed rpm : 850

Aneroid pressure h: 900

Del.quantity : 181.0...183.0 1000 : (178.0...186.0)

Spread cm3 : 5.00 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 52...60 Testina: 1st rack travel in: 11.00 Speed rpm : 900...910 2nd rack travel in: 4.00 Speed rpm: 1025...1055 4th rack travel in: 1150 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 7...15 Testina: : 275 Speed rom Minimum rack trave: 6.00 rpm : 325 Rack travel in mm : 4.50...4.70 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version rpm : 850 1st speed Rack travel in m: 12.00...12.10 nd speed rpm : 600 Rack travel in m: 12.60...12.70 2nd speed rpm : 700 3rd speed Rack travel in m: 12.50...12.70 4th speed rpm : 500 Rack travel in m: 0.00...12.40 Aneroid/Altitude Compensator Test

1st version Setting Speed

: 600 rpm hPa : 900 Pressure

: 12.60...12.70 Rack travel mm

Measurement

1/min: 600 Speed

1st pressure hPa : -

Rack travel in m: 9.50...9.90
2nd pressure hPa : 215
Rack travel in m: 10.30...10.40

3rd pressure hPa : 360

Rack travel in m: 11.50...11.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900 Speed rpm : 600

Del.quantity cm3/: 210.5...216.5 1000 s: (207.5...219.5)

cm3 : 8.00 1000 s: (12.0) Spread

Aneroid pressure h: rpm : 400 Speed

Del.quantity cm3/: 144.0...148.0

1000 s: (142.0...150.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.00 rpm : 900...910 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 160.0...200.0 1000 s: (150.0...210.0)

Rack travel in mm : 9.50...9.90

LOW IDLE

rpm : 325 Speed

Rack travel in mm : 4.50...4.70 Del.quantity cm3/: 32.0...38.0 1000 s: (30.0...40.0)

cm3 : 8.00 Spread 1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension 3.0...3.2 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : MAC 11.1 b : 07.02.89 Test sheet Edition Replaces : 8.4.88 Test oil : ISO-4113 : 0 402 746 821 Combination no. Injection pump : PES6P120A720RS7135 Pump designation EP type number : 0 412 726 807 Governor Governor design. : RQV325...850PA878-1K : D 421 815 178 Governer no. Customer-spec. information Customer : MACK : E6-300 4VH Engine : 224.0 1st version kW : 1900 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 2 417 413 011 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 101 assembly Opening : 207...210 pressure, bar Orifice plate diameter mm : 0,6 Test lines : 1 680 750 008 Outside diameter x Wall thickness x Length mm : 6.00x2.00x600

(A) Injection pump setting values

per values

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Insp. values in parentheses Set equal delivery quant.

Prestroke mm : 2.75...2.85 : (2.70...2.90) Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4 Firing order : 0-60-120-180-240-300 Phasing Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 850 Rack travel in mm : 12.90...13.00 Del.quantity cm3/: 20.0...20.2 100 s: (19.7...20.5) cm3 : 0.5Spread 100 s: (0.9) rpm : 325.0 2nd speed Rack travel in mm: 4.5...4.7
Del.quantity cm3/: 3.2...3.8
100 s: (3.0...4.0) cm3 : 0.8Spread 100 s: (1.2) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 325 1.20...1.40 travel mm rpm : 450 2nd speed : 2.80...3.10 travel mm 3rd speed : 850 rpm travel mm : 6.20...6.40 : 1000 4th speed rpm : 7.70...7.90 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 Speed rpm: 1100 Rack travel in mm: 7.00...13.00 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 850 Aneroid pressure h: 900 Del.quantity : 200.5...205.5)

: 5.00 cm3 Spread 1000 : (9.00)RATED SPEED 1st version Control Lever position degrees: 52...60 Testing: 1st rack travel in: 11.90 rpm : 900...910 Speed 2nd rack travel in: 4.00 rpm : 1025...1055 Speed 4th rack travel in: 1100 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 7...15 Testing: Speed rpm Minimum rack trave: 6.00 : 325 rpm Rack travel in mm : 4.50...4.70 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 850 Rack travel in m: 12.90...13.00 2nd speed rpm : 700 Rack travel in m: 13.30...13.50 3rd speed rpm : 600
Rack travel in m: 13.50...13.70
4th speed rpm : 500
Rack travel in m: 0.00...13.10 Aneroid/Altitude Compensator Test 1st version Setting Speed : 600 mgn hPa : 900 Pressure : 13.50...13.70 Rack travel mm Measurement 1/min : 600Speed 1st pressure hPa : -Rack travel in m: 9.90...10.30 2nd pressure hPa : 250 Rack travel in m: 10.90...11.00 3rd pressure hPa : 475

FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 900 Speed rpm : 700 Del.quantity cm3/ : 217.0...223.0 1000 s: (214.0...226.0) Aneroid pressure h: 900 Speed : 600 rpm Del.quantity cm3/: 233.0...239.0 1000 s: (230.0...242.0) cm3 : 8.00 Spread 1000 s: (12.0) Ameroid pressure h: -Speed rpm : 400 Del.quantity cm3/ : 154.0...158.0 1000 s: (152.0...160.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.90 rpm : 900...910 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 195.0...235.0 1000 s: (185.0...245.0) Rack travel in mm : 9.90...10.30 LOW IDLE Speed rpm Rack travel in mm : 4.50...4.70 Del.quantity cm3/: 32.0...38.0 1000 s: (30.0...40.0) cm3 : 8.00 Spread 1000 s: (12.00) Remarks: Delivery-valve spring pre-tension 3.0...3.2 mm.

Rack travel in m: 12.60...13.00

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : MAC 11,1 b1 : 07.02.89 Test sheet Edition : 7.10.88 Replaces : ISO-4113 Test oil Combination no. : 0 402 746 822 Injection pump Pump designation : PES6P120A720RS7135 : 0 412 726 807 EP type number Governor : RQV325...900PA878-2K Governor design. : 0 421 815 179 Governer no. Customer-spec. information Customer : MACK : E6-350 4VH Engine : 261.0 1st version kW : 1800 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 2 417 413 011 Inlet press., bar: 1.50 Test nozzle holder assembly : 1 688 901 101 **Opening** : 207...210 pressure, bar Orifice plate diameter mm : 0,6 Test lines : 1 680 750 DO8 Outside diameter x Wall thickness x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85 : (2.70...2.90) Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 : 0-60-120-180-240-300 Phasing Tolerance + - 0 : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 900 Rack travel in mm : 13.90...14.00 Del.quantity cm3/: 23.6...23.8 100 s: (23.3...24.1) Spread cm3 : 0.5100 s: (0.9) rpm : 325.0 2nd speed Rack travel in mm : 4 0 ... 4.2 Del.quantity cm3/: 3....3.8 100 s: (3.0...4.0) cm3 : 0.8 Spread 100 s: (1.2) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed 325 rpm : : 1.20...1.40 travel mm rpm : 450 2nd speed : 3.10...3.30 travel mm : 850 3rd speed rpm : 5.90...6.10 travel mm : 1000 4th speed man : 7.50...7.70 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 Speed rpm: 1130 Rack travel in mm: 7.00...13.00 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 900 Speed Aneroid pressure h: 900 Del.quantity : 230.3...241.5)

: 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 55...63 Testina: 1st rack travel in: 12.90 : 950...960 Speed rpm 2nd rack travel in: 4.00 : 1075...1105 Speed rpm 4th rack travel in: 1150 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 7...15 Testing: Speed : 275 rpm Minimum rack trave: 5.50 : 325 rpm Rack travel in mm : 4.00...4.20 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version rpm : 900 1st speed Rack travel in m: 13.90...14.00 2nd speed rpm : 625 Rack travel in m: 14.10...14.20 d speed rpm : 800 Rack travel in m: 14.00...14.10 th speed rpm : 500 3rd speed 4th speed rpm Rack travel in m: 0.00...13.50 Aneroid/Altitude Compensator Test 1st version Setting : 625 Speed rom hPa : 900 Pressure : 14.10...14.20 Rack travel mm Measurement Speed 1/min : 625 1st pressure hPa : -Rack travel in m: 8.50...8.90 2nd pressure hPa : 275 Rack travel in m: 10.00...10.10

Rack travel in m: 12.30...12.70 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 900 : 625 Speed rpm Del.quantity cm3/: 257.0...263.0 1000 s: (254.0...266.0) Spread cm3 : 8.001000 s: (12.0) Aneroid pressure h: -Speed rpm : 400 Del.quantity cm3/ : 142.0...146.0 1000 s: (140.0...148.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 12.90 rpm : 950...960 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 170.0...210.0 1000 s: (160.0...220.0) Rack travel in mm : 8.50...8.90 LOW IDLE Speed rpm : 325 Rack travel in mm : 4.00...4.20 Del.quantity cm3/: 32.0...38.0 1000 s: (30.0...40.0) Spread cm3 : 8.001000 s: (12.00) Remarks: Delivery-valve spring pre-tension 3.0...3.2 mm.

3rd pressure hPa : 570

Note remarks

Test sheet : MAC 11.1 b2 Edition : 07.02.89 Replaces : 7.10.88 : ISO-4113 Test oil

: 0 402 746 823 Combination no.

Injection pump

Pump designation : PES6P120A720RS7135

: 0 412 726 807 EP type number

Governor

Governor design. : RQV325...875PA878-3K

: 0 421 815 180 Governer no.

Customer-spec. information Customer : MACK

: EM6-275L 4VH Engine

: 202.0 1st version kW : 1950 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 011

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Opening

: 207...210 pressure, bar

Orifice plate

: 0,6 diameter mm

Test lines : 1 680 750 008

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85 : (2.70...2.90)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 875 1st speed

Rack travel in mm : 12.20...12.30

Del.quantity cm3/: 19.0...19.2

100 s: (18.7...19.5)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 325.0 2nd speed Rack travel in mm: 4.6...4.8 Del.quantity cm3/: 3.7...4.3 100 s: (3.5...4.5)

cm3 : 0.8Spread

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 325 1st speed

: 1.20...1.40 travel mm

rpm : 450 2nd speed travel mm

: 2.80...3.10

: 850 3rd speed rpm travel mm

: 6.20...6.40 1000 4th speed man

: 7.70...7.90 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1110 Speed

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 1200

Del.quantity : 190.0...195.0)

M15

cm3 : 5.00 1000 : (9.00) Spread RATED SPEED 1st version Control lever position degrees: 52...60 Testing: 1st rack travel in: 11.20 rpm : 925...935 Speed 2nd rack travel in: 4.00 Speed rpm : 1030...1060 4th rack travel in: 1150 Speed rpm : 0.00...1.00 LOW IDLE 1 Control lever position degrees: 9...17 Testing: : 275 Speed rpm Minimum rack trave: 1.50 rpm : 325 Rack travel in mm : 4.60...4.80 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 875 Rack travel in m: 12.20...12.30 rpm : 510 2nd speed Rack travel in m: 14.10...14.30 3rd speed rpm : 700 Rack travel in m: 13.20...13.40 4th speed rpm : 400 Rack travel in m: 0.00...13.80 Aneroid/Altitude Compensator Test 1st version Setting rpm : 510 hPa : 1200 Speed rpm Pressure : 14.10...14.30 Rack travel mm Measurement 1/min: 510 Speed 1st pressure hPa : Rack travel in m: 9.40...9.60
2nd pressure hPa : 280
Rack travel in m: 10.60...10.70 3rd pressure hPa : 485

Rack travel in m: 12.70...13.30 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 : 510 Speed rpm Del.quantity cm3/: 262.5...268.5 1000 s: (259.5...271.5) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 400 Del.quantity cm3/ : 145.0...149.0 1000 s: (143.0...151.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 11.20 rpm : 925...935 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 170.0...210.0 1000 s: (160.0...220.0) Rack travel in mm : 9.40...9.60 LOW IDLE rpm : 325 Rack travel in mm : 4.60...4.80 Del.quantity cm3/: 37.0...43.0 1000 s: (35.0...45.0) Spread cm3 : 8.001000 s: (12.00) Remarks: Delivery-valve spring pre-tension 3.0...3.2 mm.

M16

: 2.75...2.85 : (2.70...2.90) BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm Rack travel in mm : 9.00...12.00 Note remarks : 1-5-3-6-2-4 Firing order Test sheet : MAC 11,1 b3 : 07.02.89 : 7.10.88 Edition Replaces : ISO-4113 : 0-60-120-180-240-300 Test oil Phasing : 0 402 746 824 Combination no. Tolerance + - 0 : 0.50 (0.75) Injection pump Time to cyl. no. : 1 Pump designation : PES6P120A720RS7135 EP type number : 0 412 726 807 BASIC SETTING Governor Governor design: : RQV325...875PA878-4K 1st speed rpm: 875 : D 421 815 181 Governer no. Rack travel in mm : 11.00...11.10 Customer-spec. information Customer : MACK Del.quantity cm3/: 15.8...16.0 100 s: (15.5...16.3) Engine : EM6-225L 4VH : 165.0 cm3 : 0.51st version kW Spread : 1950 Rated speed 100 s: (0.9) TEST BENCH REQUIREMENTS rpm : 325.0 2nd speed Rack travel in mm: 4.6...4.8

Del.quantity cm3/: 3.8...4.4

100 s: (3.6...4.6) Test oil inlet temp. °C : 38...42 Overflow valve cm3 : 0.8Spread : 2 417 413 011 100 s: (1.2) Inlet press., bar: 1.50 (B) Setting of injection pump with governor Test nozzle holder assembly : 1 688 901 101 GUIDE SLEEVE TRAVEL rpm : 325 : 1.20...1.40 1st speed Openina travel mm pressure, bar : 207...210 rpm : 450 2nd speed travel mm : 2.80...3.10 : 850 Orifice plate 3rd speed rpm : 6.20...6.40 diameter mm : 0,6 travel mm rpm : 1000 4th speed : 7.70...7.90 travel mm Test lines : 1 680 750 008 GUIDE SLEEVE POSITION Outside diameter Control-Lever position Degree: -1 Speed rpm : 1110 Rack travel in mm : 7.00...13.00 x Wall thickness : 6.00X2.00X600 x Length mm (A) Injection pump setting values FULL LOAD DELIV. AT FULL LOAD STOP Insp. values in parentheses Set equal delivery quant. per values 1st version Speed rpm : 875 BEGINNING OF DELIVERY Aneroid pressure h: 900

Del.quantity : 150.5...163.5)

Test pressure, bar: 17...19

: 5.00 : (9.00) Spread cm3 1000 RATED SPEED 1st version Control lever position degrees: 52...60 Testing: 1st rack travel in: 10.00 Speed rpm : 925...935 2nd rack travel in: 4.00 rpm : 1015...1045 Speed 4th rack travel in: 1150 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 9...17 Testing: Speed : 275 rpm Minimum rack trave: 6.10 rpm : 325 Rack travel in mm : 4.60...4.80 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm :-Torque control curve - 1st version rpm : 875 1st speed Rack travel in m: 11.00...11.10 rpm : 510 2nd speed Rack travel in m: 13.20...13.40 3rd speed rpm : 600 Rack travel in m: 12.50...12.70 4th speed rpm : 700 Rack travel in m: 11.80...12.00 5th speed rpm : 350 Rack travel in m: 0.00...13.20 Aneroid/Altitude Compensator Test 1st version Setting rpm : 510 hPa : 900 Speed rpm Pressure : 13.20...13.40 Rack travel mm Measurement 1/min: 510 Speed 1st pressure hPa : -Rack travel in m: 8.50...8.90 2nd pressure hPa : 220

M18

Rack travel in m: 9.70...9.80 3rd pressure hPa : 500 Rack travel in m: 12.00...12.40 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 900 Speed rpm : 510
Del.quantity cm3/ : 234.0...240.0
1000 s: (231.0...243.0) cm3 : 8.00 1000 s: (12.0) Spread Aneroid pressure h: rpm : 400 Speed Del.quantity cm3/: 131.0...135.0 1000 s: (129.0...137.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 10.00 rpm : 925...935 beed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 135.0...175.0 1000 s: (125.0...185.0) Rack travel in mm : 8.50...8.90 LOW IDLE Speed rpm : 325

Rack travel in mm : 4.60...4.80 Del.quantity cm3/: 38.0...44.0 1000 s: (36.0...46.0) Spread cm3: 8.00 1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension 3.0...3.2 mm.

: 2.75...2.85 : (2.70...2.90) BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm Note remarks Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4 Firing order : MAC 11,1 b6 : 07.02.89 Test sheet Edition : 7.10.88 Replaces Test oil : ISO-4113 : 0-60-120-180-240-300 Phasina Combination no. : 0 402 746 825 Tolerance + - 0 : 0.50 (0.75) Injection pump Time to cyl. no. : 1 Pump designation : PES6P120A720RS7135 : 0 412 726 807 EP type number BASIC SETTING Governor Governor design. : RQV325...900PA878-5K 1st speed rpm: 900 : 0 421 815 182 Governer no. Rack travel in mm : 14.60...14.70 Customer-spec. information Del.quantity cm3/: 24.1...24.3 Customer : MACK 100 s: (23.8...24.6) Engine : EC6-350 4VH : 261.0 1st version kW Spread cm3 : 0.5: 1800 Rated speed 100 s: (0.9) TEST BENCH REQUIREMENTS rpm : 325.0 2nd speed Rack travel in mm : 4.9...5.1 Del.quantity cm3/: 3.9...4.5 Test oil inlet temp. °C : 38...42 100 s: (3.7...4.7) Overflow valve cm3 : 0.8Spread : 2 417 413 011 100 s: (1.2) Inlet press., bar: 1.50 (B) Setting of injection pump with governor Test nozzle holder : 1 688 901 101 assembly **GUIDE SLEEVE TRAVEL** rpm : 325 : 1.20...1.40 1st speed Openina travel mm : 207...210 : 450 pressure, bar 2nd speed rpm : 3.10...3.30 travel mm Orifice plate 3rd speed : 850 man diameter mm : 0,6 travel mm : 5.90...6.10 1000 4th speed rpm : 7.50...7.70 travel mm Test lines : 1 680 750 008 GUIDE SLEEVE POSITION Outside diameter Control-lever position x Wall thickness Degree: -1 : 6.00x2.00x600 rpm : 1130 x Length mm Speed Rack travel in mm : 7.00...13.00 (A) Injection pump setting values FULL LOAD DELIV. AT FULL LOAD STOP Insp. values in parentheses Set equal delivery quant.

1st version

Speed

rpm : 900

Aneroid pressure h: 1200 Del.quantity : 241.5...243.5

Del.quantity : 241.3...246.5)

per values

Test pressure, bar: 17...19

BEGINNING OF DELIVERY

: 5.00 cm3Spread 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 53...61 Testing: 1st rack travel in: 13.60 rpm : 950...960 Speed 2nd rack travel in: 4.00 rpm : 1090...1120 Speed 4th rack travel in: 1200 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 7...15 Testing: : 275 Speed rpm Minimum rack trave: 1.50 Speed rpm : 325 Rack travel in mm : 4.90...5.10 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 900 Rack travel in m: 14.60...14.70 : 625 2nd speed man Rack travel in m: 14.90...15.10 : 800 3rd speed rpin Rack travel in m: 14.70...14.80 rpm : 500 4th speed Rack travel in m: 0.00...14.50 Aneroid/Altitude Compensator Test 1st version Setting : 625 Speed rpm hPa : 1200 Pressure : 14.90...15.10 Rack travel mm

Measurement 1/min: 625 Speed 1st pressure hPa : Rack travel in m: 8.10...8.50
2nd pressure hPa : 280 Rack travel in m: 10.40...10.50 3rd pressure hPa : 650 M20

Rack travel in m: 13.30...13.70 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 Speed : 625 rpm Del.quantity cm3/: 265.0...271.0 1000 s: (262.0...274.0) Spread cm3 : 8.001000 s: (12.0) Aneroid pressure h: rpm : 400 Speed Del.quantity cm3/: 130.5...134.5 1000 s: (128.5...136.5) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 13.60 rpm : 950...960 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 120.0...160.0 1000 s: (110.0...170.0) Rack travel in mm : 8.10...8.50

LOW IDLE Speed rpm : 325 Rack travel in mm : 4.90...5.10 Del.quantity cm3/: 39.0...45.0 1000 s: (37.0...47.0) cm3 : 8.00Spread 1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension 3.0...3.2 mm.

Note remarks

Test sheet : MAC 11,1 b4 Edition : 07.02.89 : 7.10.88 Replaces Test oil : ISO-4113

Combination no. : 0 402 746 826

Injection pump

Pump designation : PES6P120A720RS7135

: 0 412 726 807 EP type number

Governor

Governor design. : RQV325...875PA878-6K

Governer no. : 0 421 815 183

Customer-spec. information Customer : MACK

Engine : EM6-250L 4VH

1st version kW : 186.0 Rated speed : 1950

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 011

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter

x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

: 2.75...2.85 : (2.70...2.90) Prestroke mm

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 875 1st speed

Rack travel in mm : 10.80...10.90

Del.quantity cm3/: 16.3...16.5

100 s: (16.0...16.8)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 325.0 Rack travel in mm: 4.5...4.7

Del.quantity cm3/: 3.9...4.5 100 s: (3.7...4.7) Spread cm3: 0.8

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

1.20...1.40 travel mm

: 450 2nd speed rom

: 2.80...3.20 travel mm

: 850 3rd speed rpm

: 6.20...6.40 travel mm

: 1000 4th speed rpm

; 7,70...7.90 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1
Speed rpm: 1100
Rack travel in mm: 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875 Aneroid pressure h: 1200

Del.quantity : 103.0...168.0)

: 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control Lever position degrees: 52...60 Testing: 1st rack travel in: 9.80 Speed rpm : 925...935 2nd rack travel in: 4.00 Speed rpm : 1010...1040 Speed 4th rack travel in: 1100 rem : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 9...17 Testing: Speed rpm : 275 Minimum rack trave: 6.00 rpm : 325 Rack travel in mm : 4.50...4.70 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm : -Torque control curve - 1st version
1st speed rpm : 875
Rack travel in m: 10.80...10.90
2nd speed rpm : 510
Rack travel in m: 13.00...13.20 rpm : 700 3rd speed Rack travel in m: 11.60...11.80 4th speed rpm : 550 Rack travel in m: 0.00...13.10 Aneroid/Altitude Compensator Test 1st version Setting Speed rpm : 510 Pressure hPa : 1200 Rack travel mm : 13.00...13.20 Measurement 1/min: 510 Speed 1st pressure hPa : -Rack travel in m: 8.60...9.00 2nd pressure hPa : 215 Rack travel in m: 10.30...10.40

Rack travel in m: 12.20...12.60 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 : 510 Speed rpm Del.quantity cm3/: 240.0...246.0 1000 s: (237.0...249.0) cm3 : 8.00 1000 s: (12.0) Spread Aneroid pressure h: -Speed rpm : 400 Del.quantity\_cm3/ : 146.0...150.0 1000 s: (144.0...152.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 9.80 rpm : 925...935 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 145.0...185.0 1000 s: (135.0...195.0) Rack travel in mm : 8.60...9.00 LOW IDLE Speed rpm : 325 Rack travel in mm : 4.50...4.70 Del.quantity cm3/: 39.0...45.0 1000 s: (37.0...47.0) cm3 : 8.00 Spread 1000 s: (12.00) Remarks: Delivery-valve spring pre-tension 3.0...3.2 mm.

3rd pressure hPa : 435

Note remarks

: MAC 11,1 c Test sheet Edition : 07.02.89 Replaces : 7.10.88 Test oil : ISO-4113

: 0 402 746 827 Combination no.

Injection pump

Pump designation : PES6P120A720RS7148

EP type number : 0 412 726 810

Governor

Governor design. : RQV325...875PA848-7K

: 0 421 815 176 Governer no.

Customer-spec. information Customer : MACK

: EM6 300L 4VH Engine

: 224.0 1st version kW : 1950 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 011

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

: 2.75...2.85 : (2.70...2.90) Prestroke mm

Rack travel in mm : 6.00...8.00

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 875 1st speed

Rack travel in mm : 11.10...11.20

Del.quantity cm3/: 19.9...20.1

100 s: (19.6...20.4)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 325.02nd speed Rack travel in mm: 4.5...4.7 Del.quantity cm3/: 3.9...4.5

100 s: (3.7...4.7)

Spread cm3 : 0.8100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed

: 1.20...1.40 travel mm

rpm : 450 2nd speed

travel mm : 2.50...2.80

3rd speed : 600 rpm

: 4.10...4.30 travel mm

: 875 : 7.30...7.50 4th speed rpm travel mm

1000

5th speed rom : 8.70...9.00 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1040 Speed

Rack travel in mm : 6.00...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875 Aneroid pressure h: 1500

Del.quantity : 199.0...201.0 1000 : (196.0...204.0) : 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 55...63 Testing: 1st rack travel in: 10.10 rpm : 915...925 Speed 2nd rack travel in: 4.00 rpm : 1000...1030 Speed 4th rack travel in: 1150 Speed rpm : 0.00...1.00LOW IDLE 1 Control lever position degrees: 7...15 Testing: Speed : 275 man Minimum rack trave: 6.00 Speed : 325 rpm Rack travel in mm : 4.50...4.70 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version rpm : 875 1st speed Rack travel in m: 11.10...11.20 rpm : 510 2nd speed Rack travel in m: 16.50...16.70 3rd speed rpm : 700 Rack travel in m: 13.30...13.50 4th speed rpm : 600 Rack travel in m: 15.50...15.70 5th speed rpm : 450 Rack travel in m: 0.00...16.60 Aneroid/Altitude Compensator Test 1st version Setting rpm : 510 hPa : 1500 mm : 16.50...16.70 Speed rom Pressure Rack travel mm Measurement

1/min: 510

1st pressure hPa : -

Rack travel in m: 8.30...8.70 2nd pressure hPa : 370 Rack travel in m: 10.70...10.80 3rd pressure hPa : 710 Rack travel in m: 14.40...14.80 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1500 Speed rpm : 510 Del.quantity cm3/ : 299.0...305.0 1000 s: (296.0...308.0) Spread : 8.00 cm3 1000 s: (12.0) Aneroid pressure h: -: 400 Speed rpm Del.quantity cm3/: 152.5...156.5 1000 s: (150.5...158.5) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 10.10 rpm : 915...925 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 140.0...160.0 1000 s: (135.0...165.0) Rack travel in mm : 8.30...8.70 LOW IDLE : 325 Speed rpm Rack travel in mm : 4.50...4.70 Del.quantity cm3/: 39.0...45.0 1000 s: (37.0...47.0) Spread cm3 : 8.00 1000 s: (12.00) Remarks:

Delivery-valve spring pre-tension 3.0...3.2 mm.

M24

Speed

BOSCH INJ. PUMP TEST SPECIFICATIONS : 2.75...2.85 : (2.70...2.90) Prestroke mm Note remarks Rack travel in mm : 6.00...8.00 : 1-5-3-6-2-4 Firing order Test sheet : MAC 11,1 d Edition : 07.02.89 Replaces : 7.10.88 Test oil : ISO-4113 : 0-60-120-180-240-300 Phasing Combination no. : 0 402 746 828 Tolerance + - ° : 0.50 (0.75) Injection pump Time to cyl. no. : 1 Pump designation : PES6P120A720RS7148 : 0 412 726 810 EP type number BASIC SETTING Governor Governor design. : RQV325...875PA878-7K 1st speed rpm: 875 : 0 421 815 184 Governer no. Rack travel in mm : 11.10...11.20 Customer-spec. information Del.quantity cm3/: 19.9...20.1 Customer : MACK Engine : EM6 300L 4VH 100 s: (19.6...20.4) 1st version kW : 224.0 Spread cm3 : 0.5Rated speed : 1950 100 s: (0.9) TEST BENCH REQUIREMENTS rpm : 325.0 2nd speed Rack travel in mm : 4.5...4.7 Test oil Del.quantity cm3/: 3.9...4.5 inlet temp. °C : 38...42 100 s: (3.7...4.7) Overflow valve Spread cm3 : 0.8: 2 417 413 011 100 s: (1.2) Inlet press., bar: 1.50 (B) Setting of injection pump with governor Test nozzle holder : 1 688 901 101 assembly GUIDE SLEEVE TRAVEL rpm : 325 : 1.20...1.40 1st speed **Opening** travel mm : 207...210 pressure, bar 2nd speed : 450 rom : 2.50...2.80 travel mm Orifice plate : 600 3rd speed rpm : 4.10...4.30 diameter mm : 0,6 travel mm : 875 4th speed rpm 7.30...7.50 travel mm Test lines : 1 680 750 008 : 1000 5th speed LDW : 8.70...9.00 travel mm Outside diameter x Wall thickness GUIDE SLEEVE POSITION x Length mm : 6.00X2.00X600 Control-Lever position Degree: -1 rpm : 1040 (A) Injection pump setting values Speed Insp. values in parentheses Rack travel in mm : 6.00...12.00 Set equal delivery quant. FULL LOAD DELIV. AT FULL LOAD STOP per values

1st version

rpm : 875

Aneroid pressure h: 1500

Speed

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Del.quantity : 199.0...204.0) : 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 55...63 Testing: 1st rack travel in: 10.10 rpm : 915...925 Speed 2nd rack travel in: 4.00 Speed rpm : 1000...1030 4th rack travel in: 1150 Speed rpm : 0.00...1.00 LOW IDLE 1 Control lever position degrees: 7...15 Testing: : 275 Speed rpm Minimum rack trave: 6.00 : 325 rom Rack travel in mm : 4.50...4.70 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 875 Rack travel in m: 11.10...11.20 nd speed rpm : 510
Rack travel in m: 16.50...16.70
rd speed rpm : 700 2nd speed 3rd speed Rack travel in m: 13.30...13.50 4th speed : 600 rpm Rack travel in m: 15.50...15.70 rpm : 450 5th speed Rack travel in m: 0.00...16.60 Aneroid/Altitude Compensator Test 1st version Setting Speed : 510 man hPa : 1500 Pressure : 16.50...16.70 Rack travel mm Measurement 1/min: 510 Speed

Rack travel in m: 8.30...8.70 2nd pressure hPa : 370 Rack travel in m: 10.70...10.80 3rd pressure hPa : 710 Rack travel in m: 14.40...14.80 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1500 Speed rpm Del.quantity cm3/: 299.0...305.0 1000 s: (296.0...308.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 400 Del.quantity cm3/ : 152.5...156.5 1000 s: (150.5...158.5) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 10.10 rpm : 915...925 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 140.0...160.0 1000 s: (135.0...165.0) Rack travel in mm : 8.30...8.70 LOW IDLE Speed rpm Rack travel in mm : 4.50...4.70 Del.quantity cm3/: 39.0...45.0 1000 s: (37.0...47.0) cm3 : 8.00 Spread 1000 s: (12.00) Remarks:

Delivery-valve spring pre-tension 3.0...3.2 mm.

M26

1st pressure hPa : -

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : 2.75...2.85 : (2.70...2.90) Note remarks Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4 Firing order Test sheet : MAC 11,1 a7 Edition : 07.02.89 Replaces : 7.10.88 Test oil : ISO-4113 Phasina : 0-60-120-180-240-300 Combination no. : 0 402 746 829 Tolerance + - 0 : 0.50 (0.75) Injection pump Time to cyl. no. : 1 Pump designation : PES6P120A720RS7135 EP type number : 0 412 726 807 BASIC SETTING Governor Governor design. : RQV325..1050PA848-8K rpm : 10501st speed Governer no. : 0 421 815 185 Rack #55vel in mm : 12.20...12.30 Customer-spec. information Del. 25 tity cm3/: 17.4...17.6 Customer : MACK 100 s: (17.1...17.9) : F6-270 4VH Engine : 201.0 cm3 : 0.51st version kW Spread : 2100 Rated speed 100 s: (0.9) TEST BENCH REQUIREMENTS 2nd speed rpm : 325.0 Test oil Rack travel in mm: 4.9...5.1 Del.quantity cm3/: 3.8...4.4 inlet temp. °C : 38...42 100 s: (3.6...4.6) cm3 : 0.8 Overflow valve Spread : 2 417 413 011 100 s: (1.2) Inlet press., bar: 1.50 (B) Setting of injection pump with governor Test nozzle holder assembly : 1 688 901 101 GUIDE SLEEVE TRAVEL 1st speed 325 rom : travel mm 1.40...1.60 Opening : 207...210 450 pressure, bar 2nd speed rom : 2.50...2.80 : 800 travel mm Orifice plate 3rd speed rpm : 4.80...5.00 diameter mm : 0,6 travel mm 4th speed : 1050 rpm : 7.30...7.60 travel mm Test lines : 1 680 750 008 5th speed : 1200 rom : 9.40...9.60 travel mm Outside diameter x Wall thickness GUIDE SLEEVE POSITION : 6.00x2.00x600 x Length mm Control-lever position Degree: -1 Speed rpm: 1210 Rack travel in mm: 7.00...13.00 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY Test pressure, bar: 17...19 1st version Speed rpm : 1050 Aneroid pressure h: 900

FULL LOAD DELIV. AT FULL LOAD STOP

Del.quantity : 174.0...176.0 1000 : (171.0...179.0) Rack travel in m: 9.60...9.70 3rd pressure hPa : 400 : 5.00 Rack travel in m: 11.00...11.50 Spread cm3 1000 : (9.00) FUEL DELIVERY CHARACTERISTICS RATED SPEED 1st version 1st version Control lever Aneroid pressure h: 900 Speed rpm : 630 Del.quantity cm3/ : 192.0...198.0 1000 s: (189.0...201.0) position degrees: 55...63 Testing: cm3 : 8.00 1st rack travel in: 11.20 Spread rpm : 1090...1100 1000 s: (12.0) Speed Aneroid pressure h: -2nd rack travel in: 4.00 rpm : 1170...1200 : 400 Speed Speed rpm 4th rack travel in: 1300 Del.quantity cm3/: 129.0...133.0 1000 s: (127.0...135.0) rpm : 0.00...1.00Speed LOW IDLE 1 Control lever BREAKAWAY position degrees: 10...18 1st version Testing: 1mm rack travel less than Speed : 275 rpm Minimum rack trave: 6.40 full load rack tr: 11.20 : 325 Speed rpm : 1090...1100 rpm Rack travel in mm : 4.90...5.10 STARTING FUEL DELIVERY CONSTANT REGULATION rpm : 325...600 Speed Speed rpm : 100 Del.quantity cm3/ : 135.0...175.0 TORQUE CONTROL 1000 s: (125.0...185.0) Dimension a mm Rack travel in mm : 8.60...9.00 Torque control curve - 1st version rpm : 1050 1st speed Rack travel in m: 12.20...12.30 LOW IDLE d speed rpm : 630 Rack travel in m: 12.00...12.20 2nd speed Speed rpm : 325
Rack travel in mm : 4.90...5.10
Del.quantity cm3/ : 38.0...44.0
1000 s: (36.0...46.0) 3rd speed rpm : 925 Rack travel in m: 11.90...12.10 4th speed rpm : 800 Rack travel in m: 12.20...12.40 cm3 : 8.00 Spread 1000 s: (12.00) Aneroid/Altitude Compensator Test Remarks: Delivery-valve spring pre-tension 3.0...3.2 mm. 1st version Setting Speed : 630 rpm Pressure hPa : 900 Rack travel mm : 12.00...12.10 Measurement 1/min: 630 Speed 1st pressure hPa : -Rack travel in m: 8.60...9.00 2nd pressure hPa : 270

Note remarks

Test sheet : MAC 11,1 a8 Edition : 10.02.89 Replaces : 6.4.88 Test oil : ISO-4113

Combination no. : 0 402 746 832

Injection pump

Pump designation : PES6P120A720RS7135

EP type number : 0 412 726 807

Governor

Governor design. : RQV325...900PA848-10

: 0 421 815 189 Governer no.

Customer-spec. information Customer : MACK

: EM6 275 2VH Engine

: 202.0 kW 1st version : 1800 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 011

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Openina (

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

: 1 680 750 008 Test Lines

Outside diameter x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

N01

: 2.75...2.85 : (2.70...2.90) Prestroke mm

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

Phasing : Ω-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 900

Rack travel in mm : 12.30...12.40

Del.quantity cm3/: 18.7...18.9

100 s: (18.4...19.2)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 325.02nd speed

Rack travel in mm : 4.6...4.8 Del.quantity cm3/: 3.7...4.3 100 s: (3.5...4.5)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

325 1st speed rom :

1.20...1.40 travel mm

rpm : 450 2nd speed

: 3.10...3.30 travel mm

3rd speed : 850 rpm

: 5.90...6.10 travel mm

rpm : 10004th speed

travel mm : 7.50...7.70

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 1120 Speed

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm Aneroid pressure h: 900

Del.quantity : 187.0...192.0) : 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 51...59 Testing: 1st rack travel in: 11.30 Speed rpm: 950...960 2nd rack travel in: 4.00 rpm : 1055...1085 Speed 4th rack travel in: 1150 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 9...17 Testing: : 275 Speed rpm Minimum rack trave: 6.10 : 325 rpm Rack travel in mm : 4.60...4.80 CONSTANT REGULATION rpm : 325...480 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 900 Rack travel in m: 12.30...12.40 nd speed rpm : 540 Rack travel in m: 13.40...13.60 2nd speed 3rd speed rpm : 700 Rack travel in m: 12.70...12.90 4th speed rpm : 450 Rack travel in m: 0.00...13.50 Aneroid/Altitude Compensator Test 1st version Setting rpm : 540 Speed hPa : 900 Pressure : 13.40...13.60 Rack travel mm Measurement 1/min: 540 Speed 1st pressure hPa :-Rack travel in m: 9.00...9.40 2 2nd pressure hPa : 320

NO2

Rack travel in m: 10.20...10.30 3rd pressure hPa : 550 Rack travel in m: 12.00...12.40 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 900 Speed rpm : 540
Del.quantity cm3/ : 239.0...247.0
1000 s: (237.0...249.0) cm3 : 8.00 1000 s: (12.0) Spread Aneroid pressure h: rpm : 400 Speed Del.quantity cm3/: 142.0...146.0 1000 s: (140.0...148.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 11.30 rpm : 950...960 Speed STARTING FUEL DELIVERY

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.60...4.80
Del.quantity cm3/ : 37.0...43.0
1000 s: (35.0...45.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension 3.0...3.2 mm.

Note remarks

: MAC 11,1 a9 : 10.02.89 Test sheet Edition Replaces : 7.10.88 : ISO-4113 Test oil

: 0 402 746 833 Combination no.

Injection pump

Pump designation : PES6P12DA72DRS7135 : 0 412 726 807

EP type number

Governor

Governor design. : RQV325...975PA848-11

: D 421 815 190 Governer no.

Customer-spec. information Customer : MACK

Engine : E6-350 2VH

1st version kW : 257.0 : 1950 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 011

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

**Opening** 

: 207...210 pressure, bar

Orifice plate

diameter mm : 0.6

Test lines : 1 680 750 008

Outside diameter

x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

N03

Prestroke mm : 2.75...2.85 : (2.70...2.90) Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 975 1st speed

Rack travel in mm : 14.10...14.20

Del.guantity cm3/: 23.0...23.2

100 s: (22.7...23.5)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 325.02nd speed

Rack travel in mm : 4.5...4.7 Del.quantity cm3/: 3.8...4.4

100 s: (3.6...4.6)

cm3 : 0.8

Spread 100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

: 1.40...1.60 travel mm rpm : 450

2nd speed

: 2.50...2.80 travel mm : 800

3rd speed rpm : 4.80...5.00 travel mm

4th speed : 1050 rpm

: 7.30...7.60 travel mm

5th speed 1200 rpm

travel mm : 9.40...9.60

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1190

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 975 Speed

Aneroid pressure h: 900 Del.quantity : 230.5...232.5 1000 : (227.5...235.5) : 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 55...63 Testing: 1st rack travel in: 13.10 Speed rpm : 1015...1025 2nd rack travel in: 4.00 rpm : 1130...1160 Speed 4th rack travel in: 1300 Speed rpm : 0.00...1.00LOW IDLE 1 Control lever position degrees: 10...18 Testing: Speed : 275 rpm Minimum rack trave: 6.00 : 325 rpm Rack travel in mm : 4.50...4.70 CONSTANT REGULATION rpm : 325...600 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version : 975 1st speed rpm Rack travel in m: 14.10...14.20 rpm : 700 2nd speed Rack travel in m: 13.70...13.90 3rd speed rpm : 600 Rack travel in m: 0.00...13.30 Aneroid/Altitude Compensator Test 1st version Setting : 700 Speed rpm hPa : 900 Pressure : 13.80...13.90 Rack travel mm Measurement 1/min: 700 Speed 1st pressure hPa : -Rack travel in m: 7.80...8.20 2nd pressure hPa : 240 Rack travel in m: 9.30...9.40

3rd pressure hPa : 510 Rack travel in m: 12.20...12.60 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 900 : 700 Speed rpm Del.quantity cm3/: 237.0...233.0 1000 s: (224.0...236.0) Spread cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: rpm : 400 Speed Del.quantity cm3/: 125.0...129.0 1000 s: (123.0...131.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 13.10 rpm : 1015...1025 Speed -STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 110.0...150.0 1000 s: (100.0...160.0) Rack travel in mm: 7.80...8.20 LOW IDLE Speed rpm : 325 Rack travel in mm : 4.50...4.70 Del.quantity cm3/: 38.0...44.0 1000 s: (36.0...46.0) cm3 : 8.00 Spread 1000 s: (12.00) Remarks: Delivery-valve spring pre-tension 3.0...3.2 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : UNI 9,5 e : 24.02.89 : 30.9.88 Test sheet Edition Replaces Test oil : ISO-4113 : 0 402 746 834 Combination no. Injection pump Pump designation : PES6P120A720RS7154 EP type number : 0 412 726 811 Governor Governor design. : RQV275...1100PA888K : 0 421 815 191 Governer no. Customer-spec. information Customer : IVECO-UNIC : 8460.41.102 Engine 1st version kW : 235.0 : 2200 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder assembly : 1 688 901 105 **Opening** : 207...210 pressure, bar Orifice plate diameter mm : 0,8 Test lines : 1 680 750 008 Outside diameter x Wall thickness x Length mm : 6.00X2.00X600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

Prestroke mm : 5.00...5.10 : (4.95...5.15) Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 : 0-60-120-180-240-300 Phasing Tolerance + - 0 : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 1100 Rack travel in mm : 11.60...11.70 Del.quantity cm3/: 21.4...21.6 100 s: (21.1...21.9) Spread cm3 : 0.5100 s: (0.9) 2nd speed rpm: 275.0
Rack travel in mm: 4.9...5.1
Del.quantity cm3/: 2.0...2.6 100 s: (1.7...2.9) cm3 : 0.8Spread 100 s: (1.2) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : : 1.20...1.40 travel mm 2nd speed : 450 rpm 3.10...3.90 travel mm : 800 3rd speed rpm : 6.30...6.70 : 1100 travel mm 4th speed rpm : 9.70...9.90 travel mm : 1200 5th speed rpm : 13.00...14.00 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 Speed rpm : 1125 Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 1100

Speed

Aneroid pressure h: 1200

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Del.quantity : 214.0...219.0) : 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control Lever position degrees: 53...61 Testing: 1st rack travel in: 10.60 Speed rpm : 1140...1150 2nd rack travel in: 4.00 Speed rpm : 1200...1230 4th rack travel in: 1350 Speed rpm : 0.00...1.00 LOW IDLE 1 Control lever position degrees: 11...19 Testing: Speed : 100 rpm Minimum rack trave: 6.50 rpm : 275 Rack travel in mm : 4.90...5.10 CONSTANT REGULATION rpm : 280...400 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 850 Rack travel in m: 12.00...12.10 2nd speed rpm : 1100 Rack travel in m: 11.60...11.70 3rd speed rpm : 950 Rack travel in m: 11.90...12.10 4th speed rpm : 750 Rack travel in m: 11.80...12.00 5th speed rpm : 400 Rack travel in m: 11.20...11.40 Aneroid/Altitude Compensator Test 1st version Setting rpm : 850 hPa : 1200 Speed Pressure : 12.00...12.10 Rack travel mm Measurement 1/min: 850 Speed 1st pressure hPa : -

Rack travel in m: 9.00...9.20 2nd pressure hPa : 515 Rack travel in m: 11.30...11.40
3rd pressure hPa : 305
Rack travel in m: 9.70...9.90 START CUT-OUT 1/min: 195 (215) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 rpm : 850 Speed Del.quantity cm3/: 196.0...202.0 1000 s: (193.0...205.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 127.0...129.0 1000 s: (124.0...132.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 10.60 peed rpm : 1140...1150 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 120.0...150.0 1000 s: (116.0...154.0) Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : PER 12,2 d Edition : 07.02.89 Replaces Test oil : ISO-4113 Combination no. : 0 402 746 835 Injection pump Pump designation : PES6P120A320RS7156 : 0 412 726 813 EP type number Governor Governor design. : RQV250..1050PA793-2 : 0 421 813 699 Governer no. Customer-spec. information : PERKINS Customer Engine : EAGLE TX 1st version kW : 280.0 : 2100 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly Openina pressure, bar : 207...210 Orifice plate diameter mm : 0,8 Test lines : 1 680 750 067 Outside diameter x Wall thickness : 6.00X1.50X1000 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

Prestroke mm : 4.50...4.60 : (4.45...4.65) Rack travel in mm : 9.00...12.00 : 1- 4- 2- 6- 3- 5 Firing order Phasing : 0-60-120-180-240-300 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING rpm: 900 1st speed Rack travel in mm : 14.20...14.30 Del.quantity cm3/: 27.7...27.9 100 s: (27.4...28.2) Spread cm3 : 0.6100 s: (0.9) rpm : 250.0 2nd speed Rack travel in mm : 5.9...6.1 Del.quantity cm3/: 1.3...1.7 100 s: (1.0...2.0) cm3 : 0.3Spread 100 s: (0.6) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 250 1st speed travel mm : 0.90...1.30 2nd speed rpm : 350 travel mm 2.90...3.50 : 700 3rd speed rpm : 4.00...4.60 travel mm rpm : 1000 4th speed travel mm : 7.40...7.60 : 1100 5th speed rpm : 8.80...9.20 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1070 Speed Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version

rpm : 900

Aneroid pressure h: 1200

Speed

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Del.quantity : 277.0...279.0 1000 : (274.0...282.0) cm3 : 6.00 1000 : (9.00) Spread RATED SPEED 1st version Control lever position degrees: 51...59 Testina: 1st rack travel in: 13.20 rpm : 980...990 Speed 2nd rack travel in: 4.00 Speed rpm : 1080...1110 4th rack travel in: 1250 Speed rpm: 0.00...1.00 LOW IDLE 1 Control lever position degrees: 17...25 Testing: Speed : 100 rpm Minimum rack trave: 7.50 : 250 rpm Rack travel in mm : 5.90...6.10 CONSTANT REGULATION rpm : 250...570 Speed Aneroid/Altitude Compensator Test 1st version Setting Speed rpm : 500 Pressure hPa : 1200 Rack travel mm : 14.20...14.30 Measurement 1/min : 500 Speed 1st pressure hPa : -Rack travel in m: 12.20...12.30 2nd pressure hPa : 850 Rack travel in m: 13.80...13.90 3rd pressure hPa : 610 Rack travel in m: 12.60...12.80 START CUT-OUT

1/min: 170 (190)

Speed

**80***M* 

**BREAKAWAY** 

1st version

1mm rack travel less than full load rack tr: 13.20 rpm : 980...990 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 130.0...170.0 Rack travel in mm : 20.00...21.00 LOW IDLE Speed rpm : 250 Rack travel in mm : 5.90...6.10 Remarks: Delivery-valve spring pre-tension 3.2...3.4 mm. Permissible alteration of 3.0...3.5 mm Because of flattening, set the spring preload on new delivery-valve holders to 2.9...3.1 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks

Test sheet Edition

: MAC 12,0 a : 10.02.89

Replaces

Test oil

: ISO-4113

Combination no.

: 0 402 746 836

Injection pump

Pump designation

: PES6P120A720RS7157 : 0 412 726 814

EP type number

Governor

Governor design.

: RQV325...900PA848-12

Governer no.

: 0 421 815 192

Customer

Customer—spec. information : MACK

Engine

: E7-400 4VH

1st version

: 298.0

Rated speed

: 1800

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

kW

Overflow valve

: 2 417 413 011

Overflow

quantity min. 1/h: 160...170

Test nozzle holder

assembly

: 1 688 901 101

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines

: 1 680 750 008

Outside diameter

x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

**NO9** 

Test pressure, bar: 17...19

Prestroke mm

: 2.75...2.85 : (2.70...2.90)

Rack travel in mm : 9.00...12.00 Firing order

: 1-5-3-6-2-4

Phasina

: 0-60-120-180-240-300

Phasing

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed

rpm: 900

Rack travel in mm : 15.50...15.60

Del.quantity cm3/: 27.2...27.4

100 s: (26.9...27.7)

Spread

cm3 : 0.5

100 s: (0.9)

rpm : 325.0 2nd speed Rack travel in mm : 4.9...5.1

Del.quantity cm3/: 4.3...4.9 100 s: (4.1...5.1)

cm3 : 0.8Spread

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed : 325 rpm

: 1.30...1.60 travel mm

rpm : 500 2nd speed

: 3.40...4.00 travel mm

3rd speed : 900 rpm

: 6.70...6.90 travel mm : 1075

4th speed rom

: 8.40...8.90 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1120 Speed

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 900

Aneroid pressure h: 1200

: 272.0...274.0 1000 : (269.0...277.0) Del.quantity Spread cm3 : 5.00 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 56...64 Testing: 1st rack travel in: 14.50 Speed rpm : 940...950 2nd rack travel in: 4.00 Speed rpm : 1115...1145 4th rack travel in: 1250 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 10...18 Testing: Speed rpm : 275 Minimum rack trave: 6.40 Speed rpm : 325 Rack travel in mm : 4.90...5.10 CONSTANT REGULATION rpm : 325...500 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 900 Rack travel in m: 15.50...15.60 2nd speed rpm : 625 Rack travel in m: 15.30...15.50 3rd speed rpm : 500 Rack travel in m: 0.00...14.60 Aneroid/Altitude Compensator Test 1st version Setting : 900 Speed rpm hPa : 1200 mm : 15.50...15.60 Pressure Rack travel mm Measurement 1/min: 900 Speed 1st pressure hPa : -Rack travel in m: 8.20...8.60 2nd pressure hPa : 225 Rack travel in m: 9.40...9.50 3rd pressure hPa : 770

Rack travel in m: 13.80...14.20 START CUT-OUT 1/min: 280 (290) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 Speed rpm : 625
Del.quantity cm3/ : 309.0...315.0
1000 s: (306.0...318.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: rpm : 400 Speed Del.quantity cm3/: 166.0...170.0 1000 s: (164.0...172.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 14.50 rpm : 940...950 Speed STARTING FUEL DELIVERY Speed : 100 rpm Del.quantity cm3/: 170.0...210.0 1000 s: (160.0...220.0) Rack travel in mm : 9.90...10.30 LOW IDLE Speed rpm : 325
Rack travel in mm : 4.90...5.10
Del.quantity cm3/ : 43.0...49.0

1000 s: (41.0...51.0)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MAC 12,0 a1 : 10.02.89 Edition Replaces Test oil : ISO-4113 : 0 402 746 837 Combination no. Injection pump Pump designation : PES6P12OA72ORS7157 : 0 412 726 814 EP type number Governor : RQV325...900PA848-15 Governor design. : 0 421 815 193 Governer no. Customer-spec. information Customer : MACK : E7-350 4VH Engine 1st version kW : 261.0 Rated speed : 1800 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 2 417 413 011 Overflow quantity min. 1/h: 160...170 Test nozzle holder : 1 688 901 101 assembly Opening : 207...210 pressure, bar Orifice plate diameter mm : 0,6 Test lines : 1 680 750 008 Outside diameter x Wall thickness x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY N11

Test pressure, bar: 17...19 Prestroke mm : 2.75...2.85 : (2.70...2.90) Rack travel in mm : 9.00...12.00 Firing order : 1-5- 3- 6- 2- 4 : 0-60-120-180-240-300 Phasing Phasing Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 900 Rack travel in mm : 14.00...14.10 Del.quantity cm3/: 22.8...23.0 100 s: (22.5...23.3) cm3 : 0.5Spread 100 s: (0.9) rpm : 325.0 2nd speed Rack travel in mm: 5.3...5.5 Del.quantity cm3/: 4.1...4.7 100 s: (3.9...4.9) cm3 : 0.8Spread 100 s: (1.2) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 325 : 1.30...1.60 1st speed travel mm : 500 2nd speed rpm : 3.40...4.00 travel mm : 900 3rd speed rpm : 6.70...6.90 travel mm : 1075 4th speed rpm : 8.40...8.90 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 Speed rpm : 1100 Rack travel in mm : 7.00...13.00 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 900 Speed Aneroid pressure h: 900

Del.quantity : 228.0...230.0 1000 : (225.0...233.0) : 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 56...64 Testina: 1st rack travel in: 13.00 Speed rpm : 950...960 2nd rack travel in: 4.00 Speed rpm : 1100...1130 4th rack travel in: 1250 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 10...18 Testina: : 275 Speed rpm Minimum rack trave: 6.80 : 325 Speed roa Rack travel in mm : 5.30...5.50 CONSTANT REGULATION rpm : 325...500 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 900 Rack travel in m: 14.00...14.10 2nd speed rpm : 625 Rack travel in m: 13.80...14.00
3rd speed rpm : 500
Rack travel in m: 0.00...13.20 Aneroid/Altitude Compensator Test 1st version Setting : 900 Speed rpm Pressure hPa : 900 : 14.00...14.10 Rack travel mm Measurement 1/min: 900 Speed 1st pressure hPa : Rack travel in m: 8.80...9.20 2nd pressure hPa : 225 Rack travel in m: 10.20...10.30 3rd pressure hPa : 545

Rack travel in m: 12.70...13.10 START CUT-OUT 1/min: 265 (275) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 900 : 625 Speed rpm Del.quantity cm3/: 260.0...266.0 1000 s: (257.0...269.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 400 Del.quantity cm3/ : 166.0...170.0 1000 s: (164.0...172.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 13.00 rpm : 950...960 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 170.0...210.0 1000 s: (160.0...220.0) Rack travel in mm : 10.40...10.80 LOW IDLE Speed rpm : 325
Rack travel in mm : 5.30...5.50
Del.quantity cm3/ : 41.0...47.0 1000 s: (39.0...49.0) Spread cm3 : 8.00 1000 s: (12.00)

Remarks:

Note remarks

Test sheet : MAC 12,0 a2 : 10.02.89 Edition

Replaces

Test oil : ISO-4113

: 0 402 746 838 Combination no.

Injection pump

: PES6P120A720RS7157 Pump designation

EP type number : 0 412 726 814

Governor

: RQV325...875PA848-14 Governor design.

: 0 421 815 194 Governer no.

Customer-spec. information Customer : MACK

: EM7-250L 4VH Engine

: 187.0 1st version kW : 1950 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 011

Overflow

quantity min. 1/h: 160...170

Test nozzle holder

: 1 688 901 101 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter

x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm

: 2.75...2.85 : (2.70...2.90)

Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Phasing

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 875

Rack travel in mm : 10.30...10.40

Del.guantity cm3/: 17.3...17.5

100 s: (17.0...17.8)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 325.0 Rack travel in mm: 4.7...4.9 Del.quantity cm3/: 4.1...4.7 100 s: (3.9...4.9)

cm3 : 0.8

Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm :

1.30...1.60 travel mm 500

2nd speed rpm

3.40...4.00 travel mm

: 900 3rd speed rpm

: 6.70...6.90 travel mm

: 1075 4th speed rpm

: 8.40...8.90 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1120 Rack travel in mm : 6.00...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875 Aneroid pressure h: 900

Del.quantity : 173.0...175.0 1000 : (170.0...178.0) : 5.00 Spread cm3: (9.00) 1000 RATED SPEED 1st version Control lever position degrees: 52...60 Testina: 1st rack travel in: 9.30 rpm : 915...925 Speed 2nd rack travel in: 4.00 Speed rpm : 1020...1050 4th rack travel in: 1200 rpm : 0.00...1.00Speed LOW IDLE 1 Control Lever position degrees: 10...18 Testing: Speed rpm Minimum rack trave: 6.20 Speed rom : 325 Rack travel in mm : 4.70...4.90 CONSTANT REGULATION rpm : 325...500 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 875 Rack travel in m: 10.30...10.40 2nd speed rpm : 510 Rack travel in m: 11.90...12.10 3rd speed rpm : 450 Rack travel in m: 0.00...11.80 Aneroid/Altitude Compensator Test 1st version Setting Speed : 510 rpm hPa : 900 Pressure Rack travel mm : 11.90...12.10 Measurement 1/min: 510 Speed 1st pressure hPa : -Rack travel in m: 8.30...8.70 2nd pressure hPa : 205

Rack travel in m: 9.30...9.40

3rd pressure hPa : 400

Rack travel in m: 11.00...11.40 START CUT-OUT Speed 1/min : 265 (275) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 900 Speed rpm Del.quantity cm3/: 244.0...250.0 1000 s: (241.0...253.0) cm3 : 8.90 Spread 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 400 Del.quantity cm3/ : 168.0...172.0 1000 s: (166.0...174.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 9.30 rpm : 915...925 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 170.0...210.0 1000 s: (160.0...220.0) Rack travel in mm : 9.80...10.20 LOW IDLE Speed rpm : 325 Rack travel in mm : 4.70...4.90 Del.quantity cm3/: 41.0...47.0 1000 s: (39.0...49.0) cm3 : 8.00 Spread 1000 s: (12.00) Remarks:

Note remarks

Test sheet : MAC 12,0 b Edition : 10.02.89

Replaces

: ISO-4113 Test oil

: 0 402 746 839 Combination no.

Injection pump

Pump designation : PES6P120A720RS7148

EP type number : 0 412 726 810

Governor

Governor design. : RQV325...875PA848-19

: 0 421 815 199 Governer no.

Customer-spec. information

Customer : MACK

: EM7 300L 4VH Engine

: 224.0 1st version kW Rated speed : 1950

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 011

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Openina

pressure, bar : 207...210

Orifice plate

: 0,6 diameter mm

: 1 680 750 008 Test lines

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

: 2.75...2.85 : (2.70...2.90) Prestroke mm

Rack travel in mm : 6.00...8.00 Firing order : 1-5-3-6-2-4

Firing order

Phasing : 0-60-120-180-240-300

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 875

Rack travel in mm : 11.50...11.60

Del.guantity cm3/: 21.0...21.2

100 s: (20.7...21.5)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 325.0 2nd speed Rack travel in mm: 4.5...4.7 Del.quantity cm3/: 4.1...4.7 100 s: (3.9...4.9)

cm3 : 0.8 Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 325 1st speed

: 1.20...1.40 travel mm

2nd speed rpm : 450

: 2.50...2.80 travel mm

: 600 3rd speed rpm

: 4.10...4.30 travel mm

4th speed rom:

: 875 : 7.30...7.50 travel mm

: 1000 5th speed rpm

: 8.70...9.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1030 Speed

Rack travel in mm : 6.00...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 1200 Del.quantity : 210.0...215.0) : 5.00 cm3 Spread 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 57...65 Testing: 1st rack travel in: 10.50 Speed rpm : 915...925 2nd rack travel in: 4.00 rpm : 1000...1030 Speed 4th rack travel in: 1150 rpm : 0.00...1.00 Speed LOW IDLE 1 Control Lever position degrees: 8...16 Testing: : 275 Speed rom Minimum rack trave: 6.00 : 325 rpm Rack travel in mm : 4.50...4.70 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version : 875 1st speed rpm Rack travel in m: 11.50...11.60 : 510 2nd speed rpm Rack travel in m: 16.00...16.20 3rd speed rpm : 800 Rack travel in m: 12.00...12.20 4th speed rpm : 600 Rack travel in m: 15.10...15.30 5th speed rpm : 450 Rack travel in m: 0.00...15.70 Aneroid/Altitude Compensator Test 1st version Setting Speed rpm : 510 hPa : 1200 Pressure : 16.00...16.20 Rack travel mm Measurement 1/min: 510 Speed

1st pressure hPa : -Rack travel in m: 8.70...9.10 2nd pressure hPa : 325
Rack travel in m: 10.60...10.70
3rd pressure hPa : 815
Rack travel in m: 14.30...14.70 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 Speed : 510 rpm Del.quantity cm3/: 294.0...300.0 1000 s: (291.0...303.0) cm3 : 8.00Spread 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 400 Del.quantity cm3/: 166.0...170.0 1000 s: (164.0...172.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.50 rpm : 915...925 Speed STARTING FUEL DELIVERY Speed : 100 rom Del.quantity cm3/: 165.0...185.0

Del.quantity cm3/: 165.0...185.0 1000 s: (155.0...195.0) Rack travel in mm : 8.70...9.10 LOW IDLE Speed rpm : 325 Rack travel in mm : 4.50...4.70 Del.quantity cm3/: 41.0...47.0 1000 s: (39.0...49.0) Spread cm3 : 8.00 1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension 3.2...3.4 mm. Permissible alteration of 3.0...3.5 mm

Note remarks

: MAC 11,1a12 : 10.02.89 Test sheet Edition

Replaces

: ISO-4113 Test oil

: 0 402 746 840 Combination no.

Injection pump

Pump designation : PES6P120A720RS7135

EP type number : 0 412 726 807

Governor

: RQV325...875PA848-18 Governor design.

: 0 421 815 198 Governer no.

Customer-spec. information Customer : MACK

: EMC6 250L 4VH Engine

1st version kW : 187.0 Rated speed : 1950

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 011

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85 : (2.70...2.90) Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no.

BASIC SETTING

1st speed rpm: 875

Rack travel in mm : 11.20...11.30

Del.quantity cm3/: 17.3...17.5

100 s: (17.0...17.8)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 325.0 2nd speed Rack travel in mm: 4.5...4.7 Del.quantity cm3/: 3.9...4.5 100 s: (3.7...4.7)

cm3 : 0.8 Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

: 1.20...1.40 travel mm rpm : 450 2nd speed

travel mm : 2.80...3.20

: 850 3rd speed rpm travel mm : 6.20...6.40

: 1000 4th speed rpm

travel mm : 7.70...7.90

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1100

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875 Aneroid pressure h: 1200

: 5.00 cm3 Spread 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 54...62 Testing: 1st rack travel in: 10.20 rpm : 915...925 Speed 2nd rack travel in: 4.00 Speed rpm : 1010...1040 4th rack travel in: 1100 Speed rpm : 0.00...1.00LOW IDLE 1 Control lever position degrees: 9...17 Testing: Speed : 275 rpm Minimum rack trave: 6.00 Speed rpm: 325 Rack travel in mm: 4.50...4.70 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 875 Rack travel in m: 11.20...11.30
2nd speed rpm : 510
Rack travel in m: 13.10...13.30
3rd speed rpm : 700 Rack travel in m: 12.00...12.20 4th speed rpm : 450 Rack travel in m: 0.00...13.10 Aneroid/Altitude Compensator Test 1st version Setting Speed : 510 rpm hPa : 1200 Pressure : 13.10...13.30 Rack travel mm Measurement 1/min: 510 Speed 1st pressure hPa : -Rack travel in m: 9.10...9.50 2nd pressure hPa : 215

Rack travel in m: 10.30...10.40 3rd pressure hPa : 435 Rack travel in m: 12.20...12.60 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 rpm Del.quantity cm3/: 239.0...245.0 1000 s: (236.0...248.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 400 Del.quantity cm3/ : 146.0...150.0 1000 s: (144.0...152.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 10.20 rpm : 915...925 Speed STARTING FUEL DELIVERY Speed : 100 rpm Del.quantity cm3/: 160.0...200.0 1000 s: (150.0...210.0) Rack travel in mm : 9.10...9.50 LOW IDLE Speed rpm : 325
Rack travel in mm : 4.50...4.70
Del.quantity cm3/ : 39.0...45.0
1000 s: (37.0...47.0) cm3 : 8.00Spread 1000 s: (12.00)

#### Remarks:

Delivery-valve spring pre-tension 3.2...3.4 mm. Permissible alteration of 3.0...3.5 mm

### Note remarks

Test sheet Edition : MB 12,0 a2 : 03,03.89 Replaces : 9.9.88

Test oil : ISO-4113

Combination no. : 0 402 746 841

Injection pump

Pump designation : PES6P120A720LS7114-2

: 0 412 726 815 EP type number

Governor

Governor design. : RQ300/1050PA774-3

Governer no. : 0 421 801 451

Customer-spec. information

Customer : DAIMLER-BENZ

Engine : 0M447 LA

1st version kW : 265.0 : 2100 Rated speed

## TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 : (5.15...5.35) Prestroke mm

Rack travel in mm : 9.00...12.00

Firing order : 6-2-4-1-5-3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no.

BASIC SETTING

rpm: 600 1st speed

Rack travel in mm : 14.00...14.20

Del.quantity cm3/: 22.9...23.1

100 s: (22.6...23.4)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 300.02nd speed

Rack travel in mm : 5.8...6.2 Del.quantity cm3/: 1.4...2.0

100 s: (1.1...2.3)

Spread cm3 : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position Degree: -2

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600 Aneroid pressure h: 1500

Del.quantity : 229.0...231.0 1000 : (226.0...234.0)

: 5.00 cm3 Spread

1000 : (9.00)

RATED SPEED

1st version

Setting point:

: 600 Speed rpm

Rack travel in mm : 20.0

Testing: 1st rack travel in: 13.00 rpm : 1095...1110 Speed 2nd rack travel in: 4.00 : 1150...1180 Speed rpm 4th rack travel in: 1300 Speed rpm : 0.00...1.50 LOW IDLE 1 Setting point w/out bumper spring : 300 Speed rpm Rack travel in mm: 6.0 Speed rpm : 300 Rack travel in mm : 5.80...6.20 Rack travel in mm : 2.00 : 360...400 Speed rom TORQUE CONTROL mension a mm : ? nd speed rpm : 1050 Rack travel in m: 14.00...14.20 Dimension a mm 2nd speed : 700 3rd speed rpm Rack travel in m: 14.70...14.90 Aneroid/Altitude Compensator Test 1st version Settina : 600 Speed rpm hPa : 700 Pressure : 14.00...14.20 Rack travel mm Measurement  $1/\min : 600$ Speed 1st pressure hPa : 300 Rack travel in m: 11.80...12.00

2nd pressure hPa : 500

Rack travel in m: 13.40...13.60

3rd pressure hPa : 1100

Rack travel in m: 14.20...14.40 4th pressure hPa : 1500 Rack travel in m: 14.70...14.90 5th pressure hPa Rack travel in m: 10.40...10.70 START CUT-OUT 1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS

Del.quantity cm3/: 234.0...238.0 1000 s: (231.0...241.0) Spread cm3 : 8.001000 s: (12.0) Aneroid pressure h: 1500 700 Speed rpm Del.quantity cm3/: 246.0...249.0 1000 s: (243.0...252.0) cm3 : 8.00 1000 s: (12.0) Spread Aneroid pressure h: -: 500 Speed rpm Del.quantity cm3/: 146.0...148.0 1000 s: (143.0...151.0) cm3 : 8.00Spread 1000 s: (12.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 13.00

STARTING FUEL DELIVERY

rom

Speed rpm : 100 Del.quantity cm3/ : 240.0...260.0 1000 s: (236.0...264.0)

: 1095...1110

Remarks:

Speed

\* Increase in control-rod travel with respect to setting at least 0.1 mm

Speed

1st version

Aneroid pressure h: 1500

rpm

: 1050

Note remarks

: MAC 11,1 e : 10.02.89 Test sheet Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 402 746 842

Injection pump

Pump designation : PES6P120A720RS7164

EP type number : 0 412 726 816

Governor

: RQV325...875PA848-17 Governor design.

: 0 421 815 200 Governer no.

Customer-spec. information Customer : MACK

: EMC6 300L 4VH Engine

: 200.0 1st version kW : 1950 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 011

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Opening

pressure, bar : 207...210

Orifice plate

: 0,6 diameter mm

Test lines : 1 680 750 008

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85 : (2.70...2.90)

Rack travel in mm : 11.00...13.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 875

Rack travel in mm : 14.60...14.70

Del.guantity cm3/: 21.9...22.1

100 s: (21.6...22.4)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 325.0 2nd speed Rack travel in mm: 4.3...4.5 Del.quantity cm3/: 3.9...4.5 100 s: (3.7...4.7)

cm3 : 0.8 Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

: 1.20...1.40 travel mm 2nd speed rpm : 450

travel mm : 3.00...3.40

: 850 3rd speed rpm : 5.90...6.10

travel mm rpm : 10004th speed

: 7.40...7.70 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1120

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875 Aneroid pressure h: 1200

Del.quantity : 219.0...221.0 1000 : (216.0...224.0) : 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 54...62 Testing: 1st rack travel in: 13.60 rpm : 915...925 Speed 2nd rack travel in: 4.00 rpm : 1060...1090 Speed 4th rack travel in: 1160 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 10...18 Testing: Speed rpm : 275 Minimum rack trave: 5.80 rpm Rack travel in mm : 4.30...4.50 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 875 Rack travel in m: 14.60...14.70 2nd speed rpm : 510 Rack travel in m: 16.70...16.90

3rd speed rpm : 700

Rack travel in m: 15.30...15.50

4th speed rpm : 600 Rack travel in m: 16.00...16.20 5th speed rpm : 420 Rack travel in m: 0.00...16.80 Aneroid/Altitude Compensator Test 1st version Setting : 510 Speed rpm hPa : 1200 Pressure : 16.70...16.90 Rack travel mm Measurement 1/min: 510 Speed 1st pressure hPa : -

Rack travel in m: 10.40...10.80 2nd pressure hPa : 375 Rack travel in m: 12.10...12.20 3rd pressure hPa : 735 Rack travel in m: 15.10...15.50 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 : 510 Speed rpm : 310 Del.quantity cm3/ : 304.0...310.0 1000 s: (301.0...313.0) Spread cm3 : 8.00 Speed rpm 1000 s: (12.0) Aneroid pressure h: rpm : 400 Speed Del.quantity cm3/: 156.0...160.0 1000 s: (154.0...162.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 13.60 rpm : 915...925 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed Del.quantity cm3/: 160.0...200.0 1000 s: (150.0...210.0) Rack travel in mm : 10.40...10.80

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.30...4.50
Del.quantity cm3/ : 39.0...45.0
1000 s: (37.0...47.0) cm3 : 8.00Spread 1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension 3.2...3.4 mm. Permissible alteration of 3.0...3.5 mm

Note remarks

Test sheet : PER 12,2 e Edition : 27.10.88

Replaces

: ISO-4113 Test oil

: 0 402 746 844 Combination no.

Injection pump

Pump designation : PES6P120A720RS7162

EP type number : 0 412 726 819

Governor

Governor design. : RQ750PA836-1 Governer no. : 0 421 801 454

Customer-spec. information : PERKINS Customer

: 2006 TAG Engine

1st version kW : 280.0 Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 019

Opening.

: 207...210 pressure, bar

Orifice plate

: 0,8 diameter mm

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.50...4.60 Prestroke mm

: (4.45...4.65)

Rack travel in mm : 9.00...12.00 Firing order : 1-4-2-6-3-5

: 0-60-120-180-240-300 Phasing

Tolerance + - 0 : 0.50 (0.75)

BASIC SETTING

rpm : 700 1st speed

Rack travel in mm : 13.00...13.10

Del.quantity cm3/: 37.9...38.1

100 s: (37.6...38.4)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 5.5...5.7 Del.quantity cm3/ : 3.8...4.4 100 s: (3.5...4.7)

Spread cm3 : 0.8

100 s: (1.2)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

: 379.0...381.0 Del.quantity 1000 : (376.0...384.0)

: 5.00 cm3 Spread

1000 : (9.00)

RATED SPEED

1st version

Testing:

1st rack travel in: 12.00

rpm : 750...755 Speed 2nd rack travel in: 4.00

rpm : 785...795 Speed

4th rack travel in: 820

Speed rpm : 0.00...1.00

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.00

Speed rpm : 750...755

STARTING FUEL DELIVERY

:

Speed rpm : 100 Del.quantity cm3/ : 300.0...340.0 1000 s: (296.0...344.0)

Remarks:

**APPLICATION** 

Generator

Note remarks

Test sheet : MAC 16,0 a Edition : 17.02.89

Replaces

Test oil : ISO-4113

Combination no. : 0 402 748 802

Injection pump

Pump designation : PES8P120A920/4LS7159

EP type number : 0 412 728 801

Governor

Governor design. : RQV325..1050PA848-21

: 0 421 815 201 Governer no.

Customer-spec. information : MACK Customer

: EE9 502 Engine

: 368.0 1st version kW : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 011

Overflow

quantity min. 1/h: 160...170

Test nozzle holder

: 1 688 901 101 assembly

**Opening** 

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

: 1 680 750 014 Test lines

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

: 3.55...3.65 Prestroke mm

(3.50...3.70)Rack travel in mm : 9.00...12.00

: 1-2-7-8-4-5-6-3 Firing order

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no.

BASIC SETTING

1st speed rpm: 630

Rack travel in mm : 12.10...12.20

Del.quantity cm3/: 21.5...21.7

100 s: (21.2...22.0)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 325.0 2nd speed

Rack travel in mm : 4.8...5.0

Del.quantity cm3/: 4.0...4.6

100 s: (3.8...4.8)

Spread cm3 : 0.8100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed

rpm : 325 : 1.30...1.60 travel mm

: 450 2nd speed rpm : 2.30...2.70 travel mm

: 800 3rd speed rpm

: 4.40...4.80 travel mm

: 1050 4th speed rpm

: 6.90...7.10 travel mm

1200 5th speed rpm

: 8.90...9.20 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1220

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version Speed rpm : 630 Aneroid pressure h: 1200 Del.quantity : 213.0...220.0) : 5.00 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 57...65 Testing: 1st rack travel in: 12.40 rpm : 1095...1105 2nd rack travel in: 4.00 rpm : 1190...1220 Speed 4th rack travel in: 1300 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 9...17 Testina: Speed rom Minimum rack trave: 6.30 rpm : 325 Rack travel in mm : 4.80...5.00 CONSTANT REGULATION rpm : 325...600 Speed TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 630 Rack travel in m: 12.10...12.20 2nd speed rpm : 1050 Rack travel in m: 13.40...13.60 3rd speed rpm : 500 Rack travel in m: 0.00...11.60 Aneroid/Altitude Compensator Test 1st version Setting Speed : 1050 rpm Pressure hPa : 1200 : 13.40...13.60 Rack travel mm Measurement 1/min: 1050 Speed 1st pressure hPa : -Rack travel in m: 8.70...9.10

2nd pressure hPa : 345 Rack travel in m: 10.20...10.30 3rd pressure hPa : 725 Rack travel in m: 12.30...12.70 START CUT-OUT Speed 1/min : 280 (290) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 : 1050 Speed rom Del.guantity cm3/: 206.0...212.0 1000 s: (203.0...215.0) cm3 : 10.00Spread 1000 s: (14.0) Aneroid pressure h: -Speed rpm : 400 Del.quantity cm3/ : 161.0...165.0 1000 s: (159.0...167.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 12.40 rpm : 1095...1105 Speed STARTING FUEL DELIVERY rpm : 100 Del.quantity cm3/: 145.0...185.0 1000 s: (135.0...195.0) Rack travel in mm : 9.60...10.00 LOW IDLE Speed rpm : 325 Rack travel in mm : 4.80...5.00 Del.quantity cm3/: 40.0...46.0 1000 s: (38.0...48.0) cm3 : 8.00Spread 1000 s: (12.00) Remarks:

Note remarks

: MB 10,0 p : 03.03.89 Test sheet Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 402 775 800

Injection pump

Pump designation : PES5P120A720LS7171

: 0 412 725 804 EP type number

Governor

Governor design. : RSV350..1050P0A529-4

: 0 421 833 319 Governer no.

Customer-spec. information

Customer : DAIMLER-BENZ

Engine : 0M449 A

: 184.0 1st version kW : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 019 assembly

Openina |

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30 : (5.15...5.35) Rack travel in mm : 20.00...21.00 Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288

Tolerance + - 0 : 0.50 (0.75)

Time to cyl. no. : 5

BASIC SETTING

1st speed rpm : 1030

Rack travel in mm : 14.40...14.50

Del.quantity cm3/: 20.9...21.1

100 s: (20.6...21.4)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm: 4.5...4.8

Del.quantity cm3/: 1.4...2.0

100 s: (1.1...2.3)

cm3 : 0.8 Spread

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position Degree: -3

rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 3.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1030

Aneroid pressure h: 1200 Del.quantity : 209.0...211.0 Aneroiu Del.quantity 1000

: (206.0...214.0)

cm3 : 5.00 Spread

1000 : (9.00)

RATED SPEED

1st version

Control lever position degrees: 50...58 Testing: 1st rack travel in: 13.40 rpm : 1080...1090 Speed 2nd rack travel in: 4.00 Speed rpm: 1170...1200 4th rack travel in: 1300 Speed rpm : 0.30...1.40 LOW IDLE 1 Control lever position degrees: 24...32 Setting point w/out bumper spring rpm : 350° Rack travel in mm : 4.6 rpm : 350 Speed Rack travel in mm : 4.50...4.80 SET IDLE AUXILIARY SPRING Rack travel in mm : 2.00 TORQUE CONTROL Torque control curve - 1st version rpm : 1030 1st speed Rack travel in m: 14.40...14.50 rpm : 850 2nd speed Rack travel in m: 14.70...14.90 3rd speed rpm : 950 Rack travel in m: 14.60...14.80 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed man Pressure hPa : 600 Rack travel mm : 14.00...14.20 measurement Speed 1/min: 600 1st pressure hPa : 250 Rack travel in m: 12.20...12.40 2nd pressure hPa : 350 Rack travel in m: 13.30...13.50 3rd pressure hPa : 800 Rack travel in m: 14.20...14.40 4th pressure hPa : 1200 Rack travel in m: 14.70...14.90 5th pressure hPa Rack travel in m: 11.30...11.70

Aneroid pressure h: 660 Speed : 600 rpm Del.quantity cm3/: 196.0...199.0 1000 s: (193.0...202.0) cm3 : 8.00Spread 1000 s: (12.) Aneroid pressure h: 1200 850 Speed rpm Del.quantity cm3/: 221.0...223.0 1000 s: (218.0...226.0) cm3 : 8.00 1000 s: (12.00 Spread : 500 Speed rpm Del.quantity cm3/: 146.0...148.0 1000 s: (143.0...151.0) cm3 : 8.00 Spread 1000 s: (12.00

#### **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 13.40 Speed rpm : 1080...1090

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 220.0...240.0 1000 s: (216.0...244.0)

### Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

1st version

FUEL DELIVERY CHARACTERISTICS